
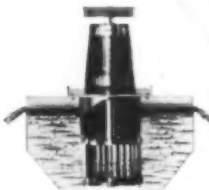









MINING
WORLD



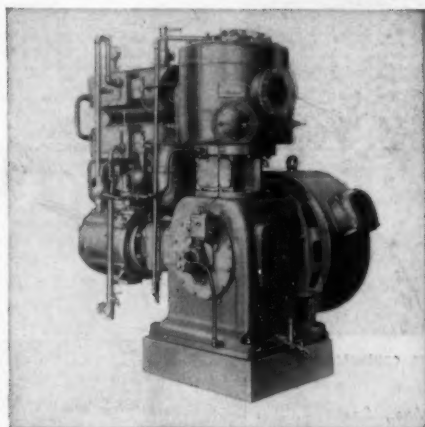
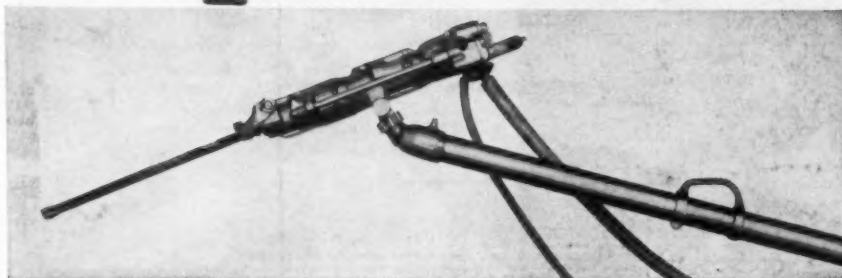
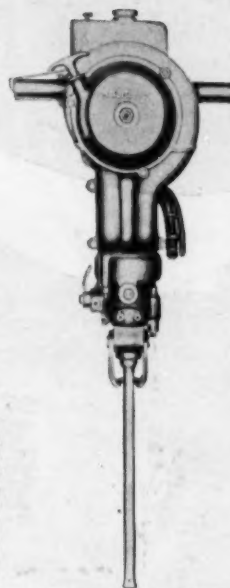
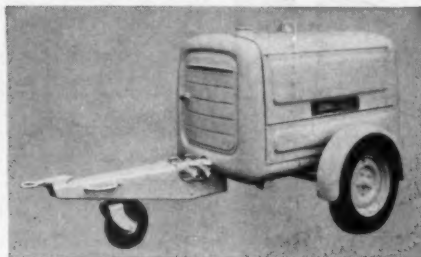
**CATALOG, SURVEY &
DIRECTORY NUMBER**

WEMCO World Standards in Mineral Processing...

FLOTATION • HEAVY MEDIA • GRAVITY CONCENTRATION		
EQUIPMENT	FEATURES	SPECIFICATIONS
	WEMCO MOBIL-MILL	Widely used for profitable production of marketable concentrates and low cost elimination of waste in treating metallic minerals, industrial minerals, coal and aggregate. Pre-engineered and pre-fabricated for maximum flexibility. Incorporates Wemco Drum type and Cone type separators for most accurate separations and highest recoveries.
	WEMCO FAGERGREN FLOTATION MACHINE	World standard of flotation in major operations with maximum capacity per cubic foot of floor space. Rotor-stator principle gives optimum pulp circulation and aeration for high metallurgical efficiency. New air control for increased cleaning efficiency. Special feed boxes eliminate costly pumping. Minimum adjustments.
	WEMCO SPIRAL CLASSIFIER	Slime-sand separations from 28 to 325 mesh. Single, double or triple spirals; tank options from straight side to full flare for desired settling area. Hydraulic lifting device available for starting under load without tank drainage. Sealed bearings, replaceable wearing shoes, continuous welded steel tube shaft assures long life.
	WEMCO REMER JIG	Ideal for concentration of large tonnages of ores where specific gravity differential exists and ratio of concentration is low. Provides exclusive differential acceleration — combined high and low frequency strokes — with live jig bed over entire surface.
	WEMCO AGITATOR-CONDITIONER	For fast, homogeneous agitating, mixing and blending. High intensity Fagergren type mixer-blender for reagents, other material with poor solubility characteristics. Propeller type available for conditioning flotation pulp, reagent mixing or blending. Certain parts interchangeable with Wemco Fagergren Machines. Turbine agitators also available for special applications.
WEMCO PUMPS		
	WEMCO DIAPHRAGM PUMP	Widely used for handling dense pulp, sludges and other fluids with solids which wear or clog other pumps. Ideal for control of hydroseparator and thickener underflow. Adjustable speed and stroke. Fast takedown and replacement of parts.
	WEMCO SAND PUMP	Handles pulps of sands, abrasive solids, slimes, slurries and heavy media; pumps flotation feed, concentrates and tailings. Used for HMS circuits, screen products and grinding mill discharge to classifiers. Change of wearing parts made readily.
	WEMCO VERTICAL SAND PUMP	Provides performance of Wemco Sand pumps with added vertical application. Used for clean-up duty installed over sump or on cross members without need for separate dry pump pit. Can be mounted inside flotation concentrate launders for pumping concentrates.
	WEMCO TORQUE-FLOW PUMP	New principle incorporates recessed impeller, continuous open passage. Permits pumping of large solids and tramp material in slurry without clogging. Wear is reduced since only small portion of slurry comes in contact with moving parts. Handles slurries with higher solids content than conventional pumps.

Look to **ATLAS COPCO** first...for:

- *Extension Steel and Rope Threaded Bits*
- *Detachable Carbide Bits*
- *Stationary and Portable Compressors*
- *Flood Lights • Hoists*
- *Cobra Motor Drills and Breakers*
- *Rock Drills and Integral Steel*



*For further details on
Atlas Copco and Coromant equipment, contact:*

ATLAS COPCO PACIFIC—930 Brittan Avenue, San Carlos, California

ATLAS COPCO EASTERN—610 Industrial Avenue, Paramus, New Jersey

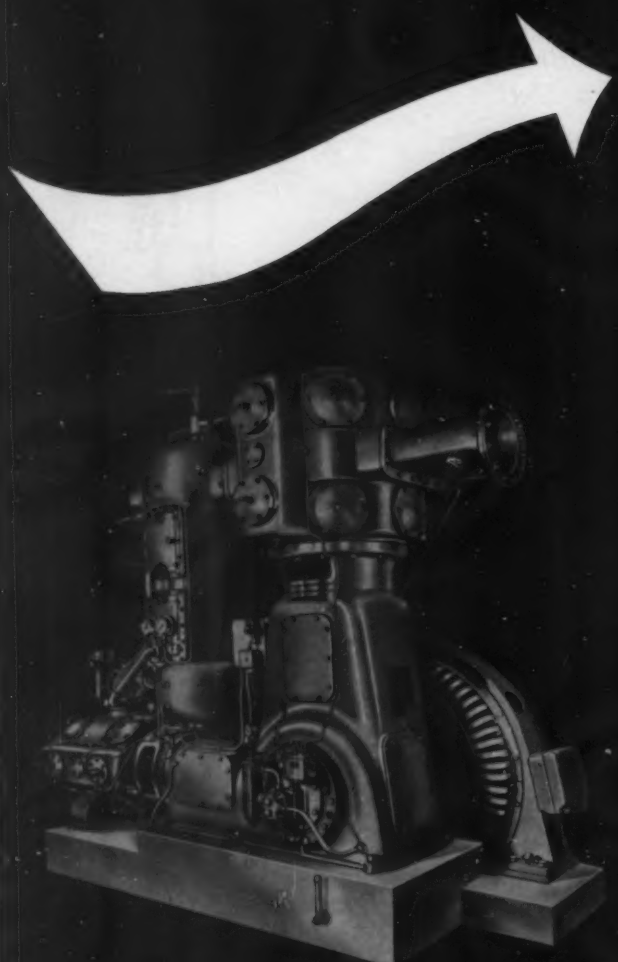
ATLAS COPCO CANADA LTD.—Montreal, Quebec

ATLAS COPCO MEXICANA S. A.—Torreon, Coahuila, Mexico

CATALOGUE, SURVEY & DIRECTORY NUMBER, 1959



Let us help you answer
these questions
about compressed air:



- Can compressed air be produced more efficiently and economically?
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- Is compressor capacity enough to give full pressure throughout the entire air system?
- Can present compressor plant be improved by re-location and re-installation?
- Is the efficiency of present compressors such that it is advisable to continue running them?

Atlas Copco engineers are available to help you solve these problems and to give you the benefit of advice of specialists in all fields of compressed air engineering. Atlas Copco field offices give rapid service throughout the West.

Write for further information.

PRINCIPAL DATA

Conservative rating for 24-hour duty.

Model	Speed r.p.m.	Performance at 100 p.s.i.		
		Free air delivery c.f.m.	Power consumption h.p.	Cooling water cons. l.g.p.h.r.
AR1°	600	330	62	300
AR3°	500	570	105	500
AR4°	450	795	146	725
AR5	360	960	177	850
AR7	327	1710	314	1500
AR9	300	3220	588	2900

*Portable skid-mounting available for semi-permanent installations.

For further details on Atlas Copco AR compressors, contact:

ATLAS COPCO PACIFIC—930 Brittan Ave., San Carlos, Calif.

ATLAS COPCO EASTERN—P.O. Box 2568, Paterson 25, N.J.

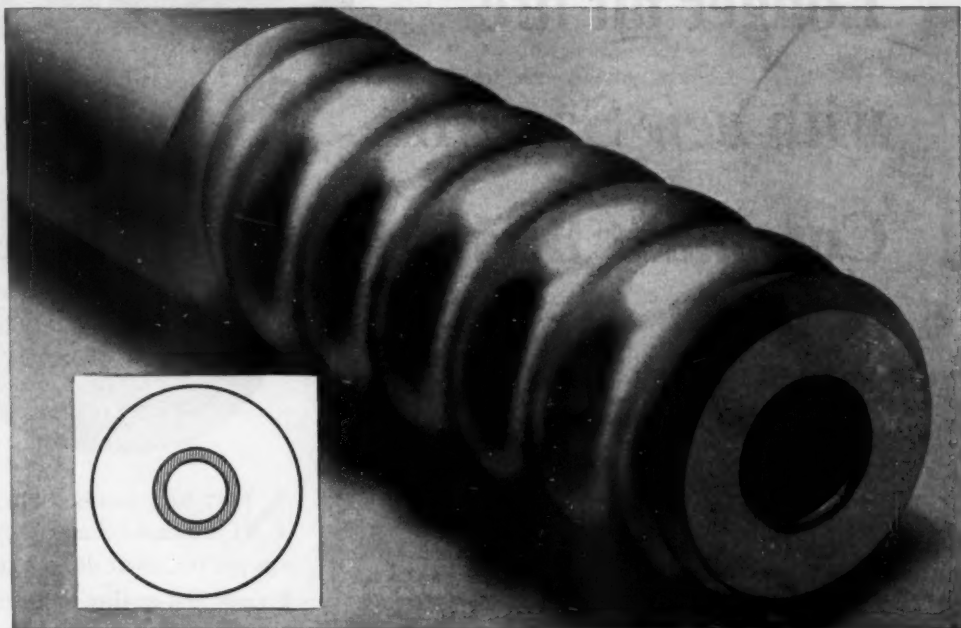
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Distributors of CARBIDE BITS, DRILL STEEL, COMPRESSORS, ROCK DRILLS, PNEUMATIC EQUIPMENT



NEW ROPE THREAD MAKES UNCOUPLING EASY WITH SANDVIK COROMANT EXTENSION STEELS



Rope-Type Threads Afford No Starting Points for Fractures

Connections used in extension drill-steel must be easy to assemble and uncouple, and connections must not become weak links during the actual drilling. Sandvik Coromant's new patented rope thread makes it easy to join and uncouple the equipment . . . yet gives a solid and positive connection. The gently rounded form of this thread means trouble-free performance—eliminates common thread and coupling failures found in "saw-tooth" threads. The complete equipment—bit, rod, coupling sleeve and shank adapter—are all dependable Sandvik Coromant parts made of world-renowned Sandvik alloy steel. A further advantage to the user is that the steel can be re-threaded. Atlas Copco has special literature on Sandvik Coromant extension steel and long-hole drilling, available to you with no obligation. We suggest you write today!

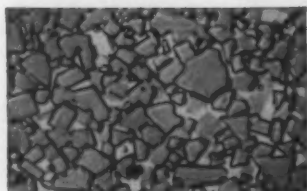
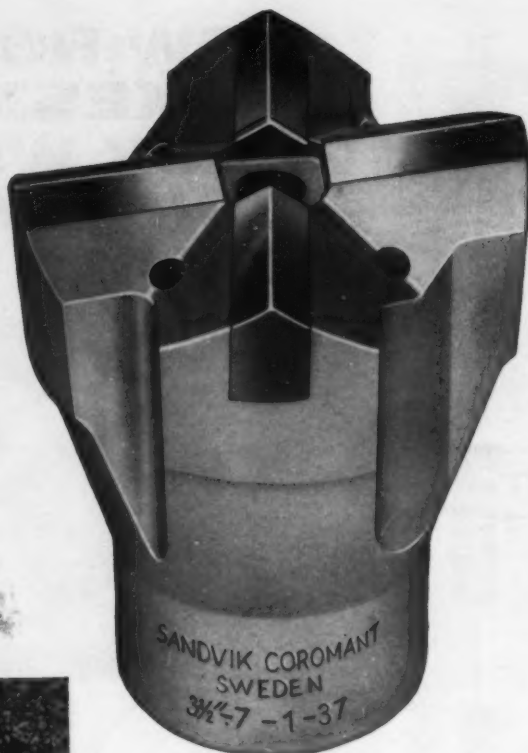


610 Industrial Ave.
Paramus, New Jersey

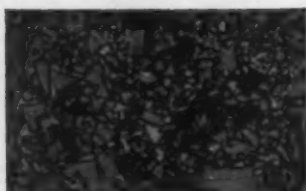
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Distributors of COMPRESSORS, ROCK DRILLS, PNEUMATIC EQUIPMENT,
SANDVIK COROMANT DRILL STEEL and CARBIDE BITS

Longer bit life— with *new* Sandvik Coromant Bits



Sandvik Coromant Tungsten Carbide
(Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



Low quality Tungsten Carbide
(Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

Sandvik Coromant Detachable Bits are Available in the following Thread Sizes and Bit Diameters

		Available Diameters, in inches																		
Type	Thread	1 1/8	1 1/2	1 3/4	1 5/8	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	3	3 1/2	4	4 1/2	5				
SHOULDER	TAPER	x	x	x	x															
	F		x	x																
	113		x																	
	H			x	x	x	x	x		x										
	115			x	x															
	D					x	x	x	x	x	x	x	x							
BOYCE MINING	K												x	x	x	x				
	1" Rope				x	x	x	x	x											
	1 1/4" Rope					x	x	x	x			x								
	400					x	x		x			x								
	1 1/2" Rope										x	x	x	x	x					
	600										x	x	x							
	700											x	x							
	117.5														x	x				
	2" Rope														x	x				
	1000															x				

NEXT time you buy bits, specify Sandvik Coromant because they give more footage per bit, lower drilling costs. Here's why:

- 1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.
- 2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.
- 3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—and Sandvik Coromant extension steel equipment.

Write or phone today for further details to either of the addresses below:

610 Industrial Avenue
Paramus, New Jersey
COlfax 1-6800

Atlas Copco

930 Brittan Avenue
San Carlos, California
LYtell 1-0375

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ON THE COVER

Mining in the 15th Century. From an original German wood block print. Check the Catalog section to see the equipment used today.

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Ni-Hard ball mill liner grinds 600,000 tons of ore in 711 days

Performance like this — based on an actual case history — is the rule . . . not the exception.

Even under the toughest service conditions possible, Ni-Hard* nickel-chromium white cast iron liners last longer than any other liner material. With Ni-Hard liners you substantially increase the interval between relinings.

Ni-Hard — with its outstanding abrasion resistance is economical as well

With chill cast hardness above 600 Brinell, Ni-Hard liners provide excellent abrasion resistance and the longest service life available. Ultimate economy is measured by the cost of liner material worn away in grinding each ton of product.

If abrasion is costing you money, put Ni-Hard to work in your plant. Many of the authorized Ni-Hard foundries are regular producers of Ni-Hard liners as replacement parts for standard mills. Many manufacturers recommend Ni-Hard liners as original equipment for their mills.

For information on how you can take advantage of economy of Ni-Hard, drop a note to the address below. Technical information and a list of regular producers are available.

*Registered trademark



THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street
New York 5, N. Y.



Rear-Dump
"Eucs" have payload capacities of 10 to 50 tons—are powered by engines of 128 to 670 total h.p. . . have loaded speeds up to 41 mph.

Check Euclid Performance for Lower Hauling Costs

Leading contractors, mines, quarries and industrial users of heavy earthmoving equipment the world over have standardized on Euclids for tough off-highway hauls. They know from years of experience on their own operations that "Eucs" get more work done every shift—that production cost is lower than with other types and makes of equipment.

Euclid has a complete range of sizes and models to fit every job requirement—rear dump and bottom dump haulers, self-powered scrapers and the world's most powerful crawler tractor. Your Euclid dealer will be glad to provide a production-cost estimate on your present or planned operations—be sure to see him before you replace or add to your equipment fleet—and have him show you why Euclids are your best investment.

EUCLID Division of General Motors Corporation
Cleveland 17, Ohio



Bottom-Dumps carry payloads of 13, 17 and 25 cu. yds. struck . . . are powered by 218 to 335 h.p. engines . . . have top speeds up to 34 mph. Full length, unobstructed door openings make these "Eucs" ideal for dumping free-flowing material into drive-over hoppers.



The TC-12 Crawler has 2 engines and independent track-drive . . . 402 net h.p. . . full power shift . . . top speed of 7.8 mph. This "Euc" tractor has unequalled work-ability for heavy dozing, ripping and similar work in construction, mining and logging.



This "Twin" Scraper has 2 engines with Torqmatic Drive . . . all wheel drive permits self-loading . . . struck capacity is 24 cu. yds. There are six other Euclid Scrapers, overhung engine and six wheel types, with struck capacities ranging from 7 to 24 yds.—9 to 32 yds. heaped.



EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

THE 40-R

**Ability to handle the most
punishing work and be ready
when you need it
makes the BUCYRUS-ERIE 40-R
the most outstanding
rotary drill on the market,
under all drilling conditions**

In Granite-Hard Formations operator can exert maximum down pressure on the bit for most effective penetration.

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In Fissured Formations the 40-R instantly adapts to each new set of conditions without stopping the operation.

For illustrated bulletins on the 40-R (diesel or electric for drilling 6¾ to 9-in. holes) or the 50-R (full electric for drilling 9¾ to 12¼-in. holes) write Dept. 1B59G, Bucyrus-Erie Company, Drill Division, Richmond, Indiana.



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for Mines, Pits and Quarries

Widely recognized as standards of efficiency and dependable service, McLanahan equipment is on duty the world over.

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- Dryers of Revolving Type
- Dry Pans, Super Heavy Duty
- Elevators
- Super Black Diamond and Pioneer Crushers
- Portable and Semi-Portable Crushing Plants
- Scrap Bundlers
- Mixers and Blenders
- Hoists
- Special Machinery

Descriptive bulletins are available on the equipment shown here. Write for copies today.

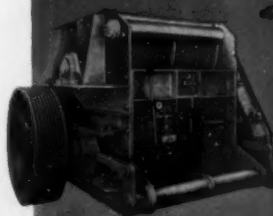
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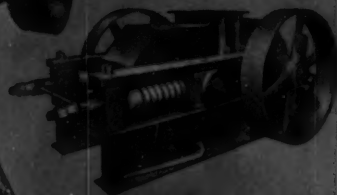
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HEADQUARTERS SINCE 1835



Rockmaster Primary
Single-Roll Crusher



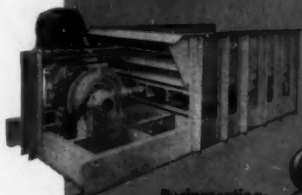
Triple Roll Crusher



Heavy Duty Double-
Roll Crusher



Heavy Duty
Revolving Scrubber



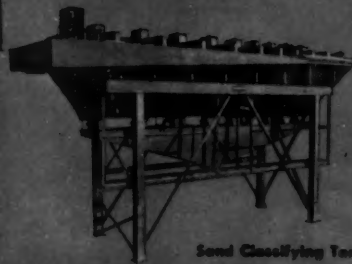
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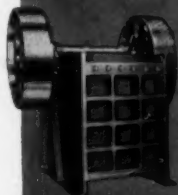
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and Screen



Sand Drag



Sand Classifying Tank



Jaw Crusher



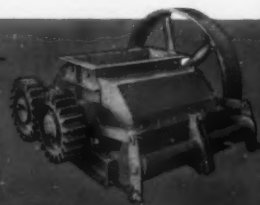
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Washer



*If purchases
are
endorsement...*

P&H ELECTRICS ARE THE CHOICE OF SOUTHWEST'S MINES

P&H Electrics are setting new standards of production and maintenance economy in Arizona, New Mexico, Nevada and Utah iron and copper mines. For instance, today *three or more* P&H Electric Shovels are working at *each* of 7 out of Arizona's 8 operating copper mines!

The pattern of preference for P&H among copper mine operators is especially significant. Here, industry management must constantly concern itself with selection and performance of the big shovels—the "giants" that require a large capital investment and importantly influence tonnage costs.

Reasons why P&H Electrics are a popular choice among the southwest's mines include such P&H innovations as MAGNETORQUE® and ELECTRONIC CONTROL—each of these *exclusive* P&H features contribute mightily to steady day-in and day-out high production.

Also, P&H users get single source responsibility, as P&H designs, manufactures and applies all electric rotating equipment specifically for electric shovel service.

HARNISCHFEGER

Construction & Mining Division
Milwaukee 46, Wisconsin

P&H ELECTRIC SHOVEL LINE: 3½ through 10 cu. yd. capacities



ANNOUNCING TWO NEW LIMAS

TYPE 64

1¼ Yd. Shovel
40 Ton Crane
13' 3" Long Crawlers
10' 8" Wide Crawlers
With 30" Treads

TYPE 64-SC

SPECIAL CRANE
50 Ton Capacity
17' 1½" Long Crawlers
14' 0" Wide Crawlers
With 42" Treads

- Easily converts in field for use as shovel, crane, dragline, clamshell or pullshovel
- Crawler, truck or wagon mounting available
- Choice of gas or diesel power—with torque converter
- Lima's precision air control lets operator work all day without tiring

Newest Lima, Type 64—shown here with 22-ft. boom, 18-ft. handle, 1¼-yd. dipper. 2 and 2¼-yd. coal loading dippers available.

The rugged new Lima Type 64 fills a definite need for a heavy duty 1¼-yd. shovel, 40-ton crane, dragline and 1¼-yd. pullshovel that will combine dependable high performance with low maintenance costs, for maximum profit! The new type 64-SC with extra long, wide crawlers is designed for special crane service. This new Lima has a capacity of 50 tons on a 40' boom at 10' radius.

Lima Quality Features

You get these, and many more, Lima quality features in the 64 and 64-SC: precision-machined teeth on heat-treated alloy steel gears; long-lasting, trouble-free anti-friction roller bearings; safe, sure band brake and jaw clutch power steer-

ing; splined shafting; extra-large-diameter hoist, crowd swing and propel clutches; independent planetary boom hoist.

Crawler truck base is strong one-piece alloy steel casting with integral machined ring gear and flame-hardened roller path. Rotating base is one-piece carbon steel casting, built to absorb severest shocks of hard digging. Center pin is relieved of strain by six hook-type conical rollers tapered to revolve naturally around double-flanged roller path.

Like all Limas, the 64 and 64-SC are good travelers. Strips down easily for haulage. Side frame assemblies, complete with treads, are simple to remove. Ledge mounted, one-piece rear counterweight can be easily removed. When equipped

for crane service, folding or telescoping gantries can be lowered to cab height for low clearance.

Designed to Outperform

Service is easy, every part readily accessible. Simplicity of power transmission design lessens friction, reduces upkeep, and delivers more power. Torque converter prevents engine stall, cushions shocks to operator and machine, increases performance by building up line pull.

Learn more about the Type 64 and 64-SC, newest members of the Lima family of high-performance construction equipment—The Lima line includes shovels to 6 cu. yd., cranes to 110 tons, draglines variable. Write or see your Lima distributor now.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



NEW 5 FRONT HOLES SHOOT
ALL AIR OR WATER FORWARD

WIDER WING
CLEARANCE
LETS CHIPS
CLEAR FASTER



*For drifters, sinkers
and stopers . . .*

NEW TIMKEN® THREADED BIT CLEARS CHIPS FASTER, KEEPS DUST DOWN

THE illustration at left shows how this new Timken® threaded carbide insert bit clears chips faster, keeps dust down in mines. The new 5 front holes shoot water directly against the rock, wash chips back faster. The deeper, wider wing clearance helps speed chip removal. You drill rock, not chips. And this new improved water circulation, by keeping dust down, helps make mining safer.

This fast wash back ends drill steel clogging, protects bit skirts against damage. And the new, special analysis carbides have greater shock-and-wear resistance. They can be reconditioned many times. Improved thread contact minimizes breakage.

For more hole-per-bit, use this new Timken threaded carbide insert bit. Get full details in free brochure. Write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

See us at the American Mining Congress 1959
Coal Show, Booth 900, May 11-14, Cleveland
Public Auditorium, Cleveland, Ohio

FOR OTHER TOUGH DRILLING JOBS



Improved Timken all-steel multi-use bit, with correct, controlled reconditioning, gives you lowest cost per foot-of-hole when you can drill out full increments of steel.



New Timken tapered socket carbide insert bit is removable for full steel life, tapered for more secure union. Has same frontal features as threaded bit. Gives you bit removability with one-piece steel strength!



TIMKEN®

REMOVABLE
ROCK BITS

UNDERGROUND OR "ON TOP"...

Only a clam-action 4-in-1 gives you a "one-man equipment fleet"!



"Go underground" with your choice of the one cu. yd. TD-6 or 1½ cu. yd. TD-9 4-in-1 mining model! Either International Drott outfit gives you a "one-man equipment fleet"—with versatility unlimited!

Strip-mining companies and contractors make effective use of 4-in-1 four-machine utility—for stripping overburden, clearing land, building haul roads, loading coal and ores.

J. F. Coal Corporation, Summersville, W. Va., reports using their 3 cu. yd. TD-20 4-in-1 for many phases of their work—often doing jobs impossible with regular dozer or loader (note action scene). This unit's 43,150 lbs. of pry-action break-out gives power shovel-like break-out power!

"Backing-dragging" with exclusive clam-action J. F. Coal Corporation shows how their TD-20 4-in-1 "dresses" a bank and pulls down "slide" rock. Shuttle-Bar control speeds back-and-forth cycles!

Both versatile, big-capacity rigs meet rigid U. S. Bureau of Mines safety standards for non-coal mining. Both feature a short-coupled stainless steel scrubber that cools exhaust while dissolving irritants with water-bath turbulence.

TD-6 and TD-9 mining 4-in-1's feature low trolley-clearing profile, mine-tunnel maneuverability and special "lean-over" features. Both mining models carry U.S. Bureau of Mines Approvals (No. 2409, 2410).



Move the selector lever of any International Drott 4-in-1—see how you get big-capacity performance instantly of four versatile machine actions. Try the 4-in-1 as dozer, clamshell, "carry-type" scraper, heavy-duty excavator-loader. See your International Drott Distributor for a demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



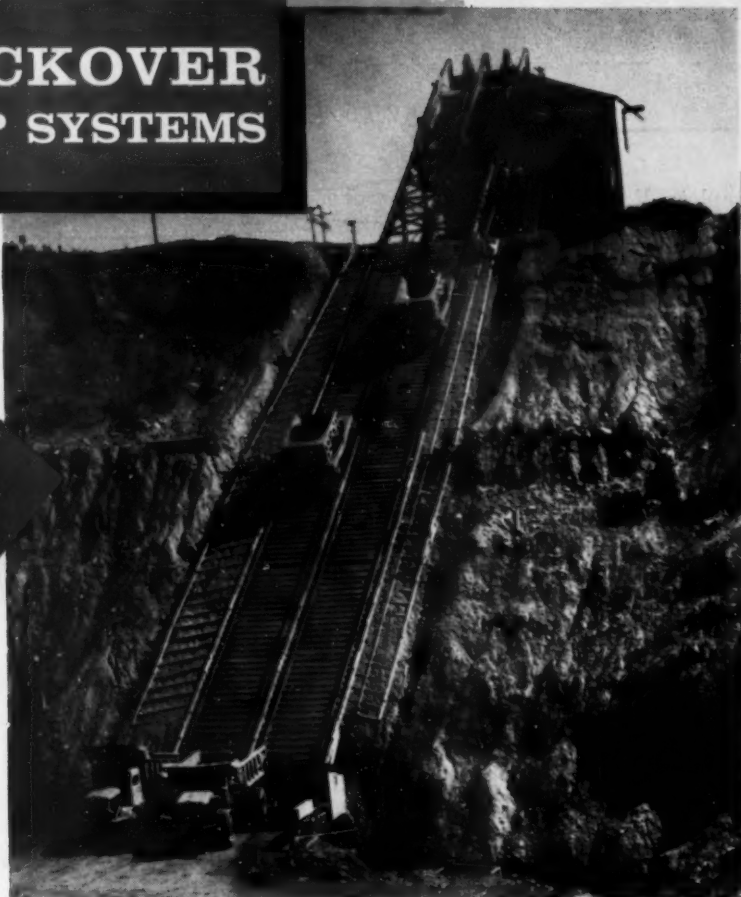
INTERNATIONAL
DROTT

Elevate materials at **LOWEST COST PER TON**

with

**ROCKOVER
SKIP SYSTEMS**

**IN USE
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The **ROCKOVER SKIP SYSTEM** has proven to be the most economical method to elevate materials from open pits. It uses the shortest and fastest hauling route, has the lowest operating and maintenance costs and requires no large investment in parts and standby equipment.

Rockover Skip Systems require no expensive wide roads for pit access and require a minimum of personnel . . . are flexible to follow pit bottom as operations go deeper . . . haul either waste or ore at anytime . . . may be loaded at any desired bench and require no sizing equipment in the pit.

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SKIPS FROM 15 TO 50 TON CAPACITIES AVAILABLE

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Subsidiary of Pettibone Mulliken Corp., Chicago 51, Illinois

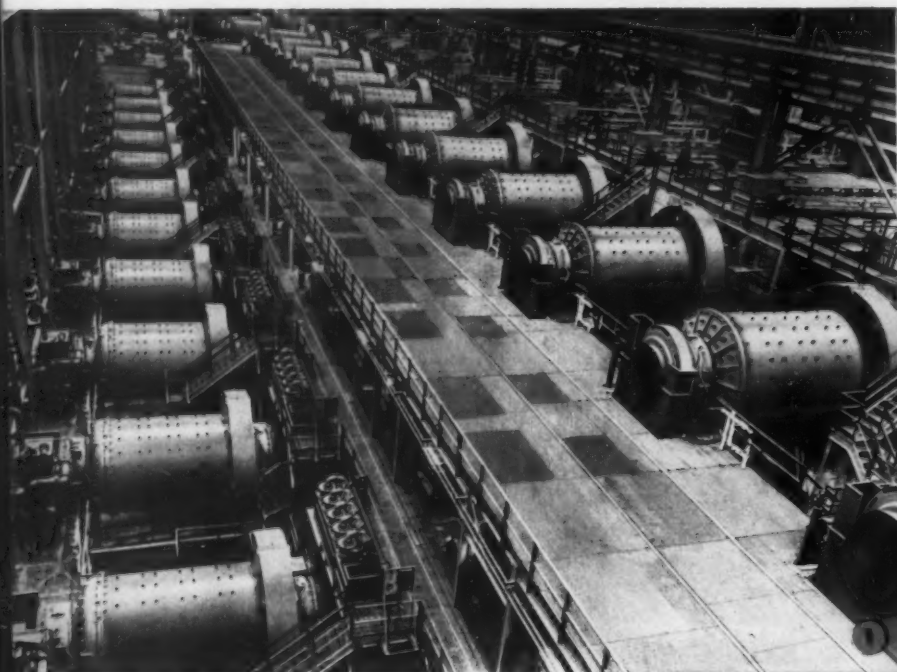
To Increase Production and Lower Operating Costs...Specify **NORDBERG MINING MACHINERY**

The complete line of heavy-duty Nordberg mining machinery includes Symons® Gyratory Crushers for primary breaking; Symons Cone Crushers for secondary and tertiary crushing; Grinding Mills; Symons Vibrating Grizzlies and Screens; Mine Hoists; and Nordberg Engines for mine and mill power.

Rugged, heavy duty construction of Nordberg mining machinery assures continuous production at low operating and maintenance costs.

Here is mining machinery that is used by the world's leading producers of ores and industrial minerals.

Write for complete information.

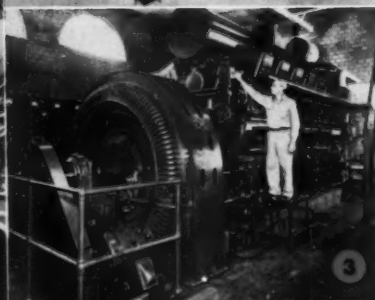
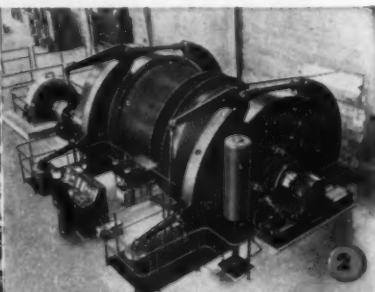


1 GRINDING MILLS . . . Ball, pebble, tube, rod and compartment types for wet or dry, open or closed circuit operation. Sizes to 13' diameter and up to 50' long.

2 MINE HOISTS . . . Built in conventional drum types as well as in friction types, for hoisting both ore and men, in a wide range of sizes to meet large coal and metal mining operations.

3 NORDBERG ENGINES . . . From small power-units to large stationary plants, for Diesel, Duafuel®, and Spark-Ignition Gas operation, in sizes to over 11,000 horsepower.

4 VIBRATING SCREENS and GRIZZLIES . . . In types and sizes to meet practically all requirements from heavy scalping to fine screening applications.



NORDBERG MFG. CO., Milwaukee 1, Wisconsin

NORDBERG

SYMONS . . . a registered Nordberg trademark known throughout the world.

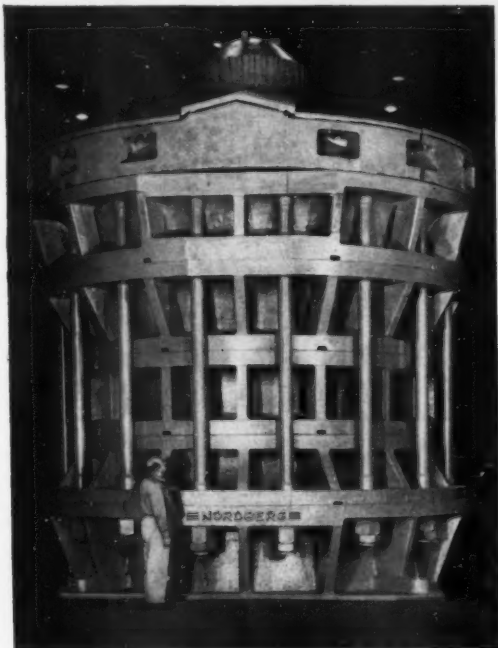
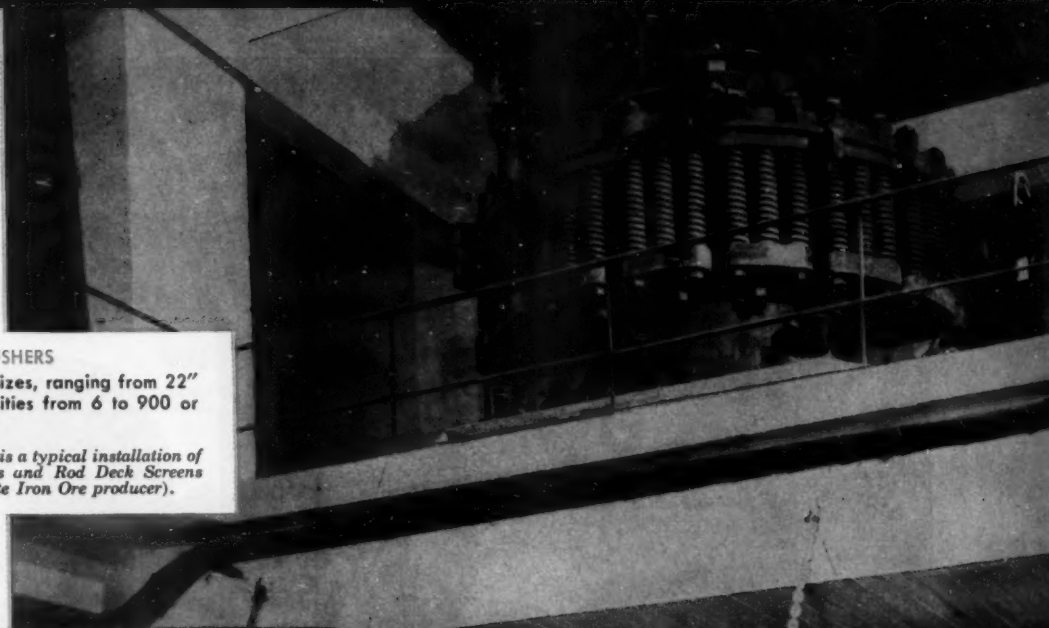


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SYMONS CONE CRUSHERS

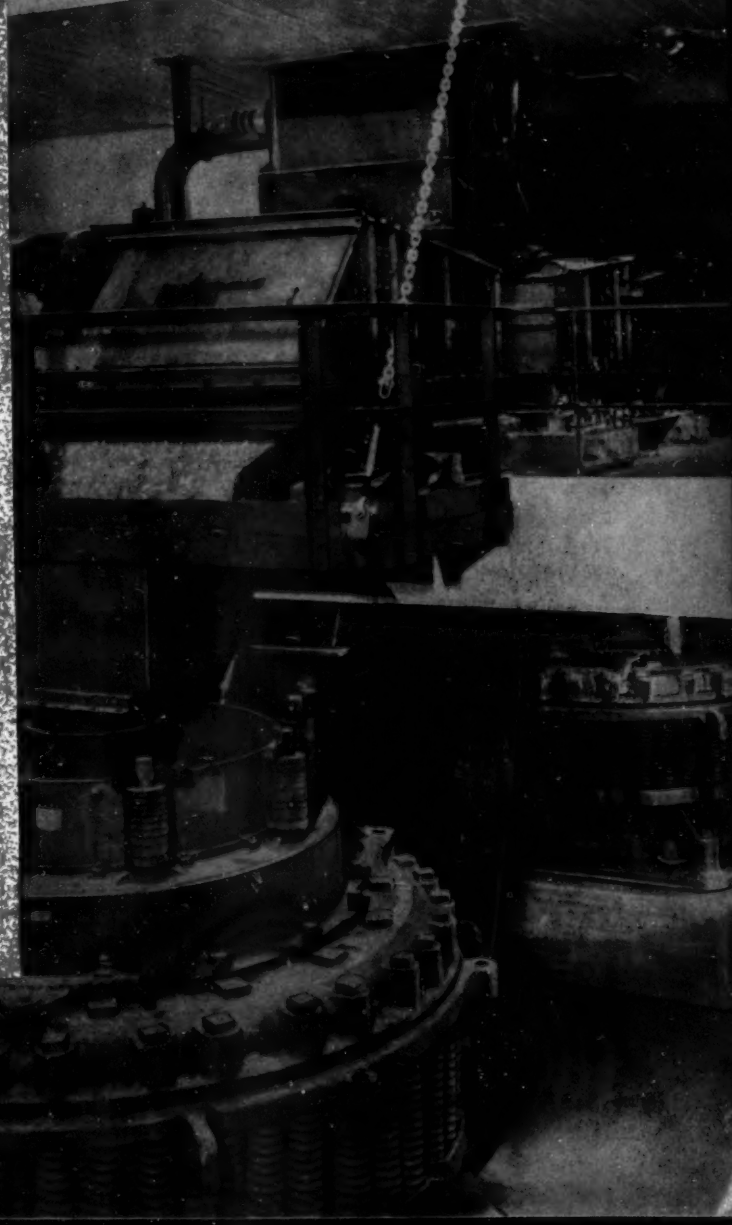
Built in 11 different sizes, ranging from 22" to 7' dia., for capacities from 6 to 900 or more tons per hour.

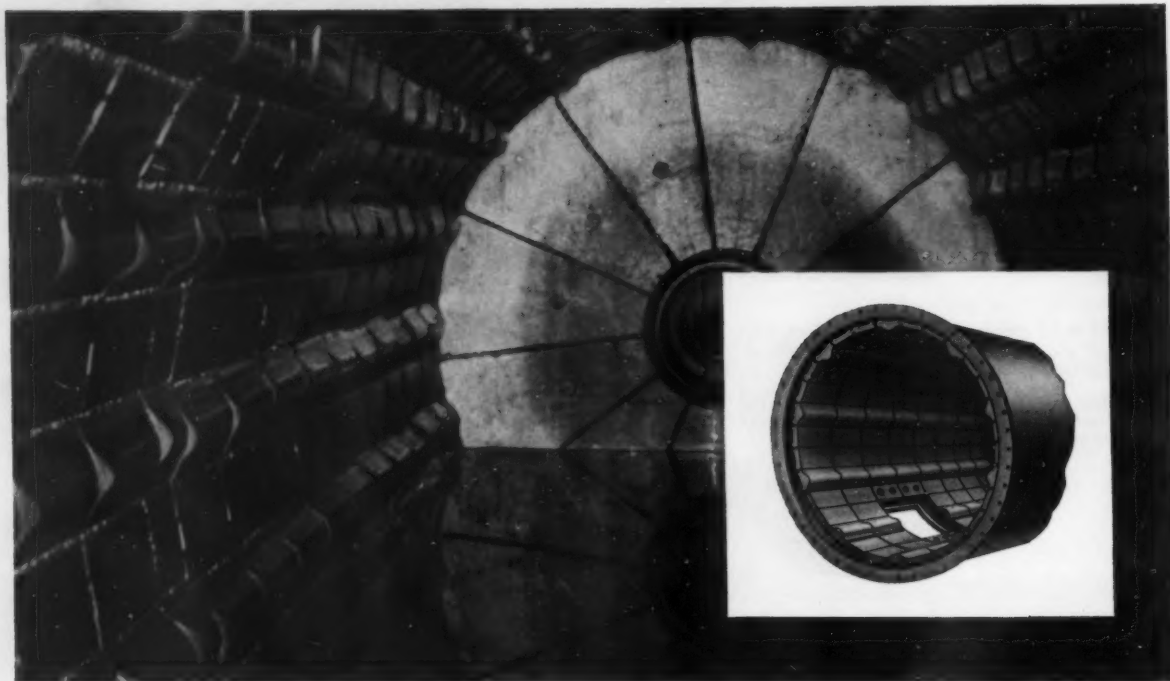
(Illustrated at the right is a typical installation of Symons Cone Crushers and Rod Deck Screens serving a large Taconite Iron Ore producer).



SYMONS GYRATORY CRUSHERS

For heavy-duty primary breaking, available with feed opening sizes of 30", 42", 48", 54", 60" and 72", for capacities to 3,500 and more tons per hour.





8

Reasons Why You Should Standardize with B&W Universal Liner Plates

Better Performance with Lower Costs— Same Casting Fits All Mill Sizes

B&W Tube Mill Liners reduce capital, time and labor costs. Consequently, they reduce the cost of the material ground. Here are eight reasons why:

1. Lower Initial Costs—standardization eliminates chiller and pattern costs.
2. Longer Life For Liners—better quality control on a mass production casting, utilizing permanent molds, results in uniform wear. Ideal size for uniform chill and heat-treatment.
3. Longer Life for Different Applications—this is assured by selection of proper materials. Design is suitable for either chilled irons or wear steels.
4. Reduced Costs in Both Direct Labor and Outage—installation time is less because small size and weight of castings allows them to be handled easily, without cranes and with less fatigue for workers.
5. Reduces Costs in Storage Space—because small castings stack easily, little storage space is required. One design of casting interchangeable for all size mills also simplifies records.
6. Reduced Costs in Liner Inventory—standardization is possible because one design fits all dia-

meters of mills. Standardization means quicker unloading and storage.

7. Reduced Costs on Breakage Claims and Delays for Replacements—small castings are rugged and almost impossible to break by handling. Large castings of hard, brittle irons sometimes break in shipment.
8. Reduced Costs in Determining Most Efficient Wear Patterns—you can get wear profiles consisting of all lifter ribs or all flats from the same castings, as well as a combination of both including straight or spiralled lifter pattern.

Liners are supplied in two nominal thicknesses, 1½" and 3" with 1½" high lifters. Castings are 6" wide x 12" long. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. For additional information on B&W Universal Tube Mill Liner Plates write The Babcock & Wilcox Company, Process Equipment, Barberton, Ohio.

S-471





**WHEN THE DIGGING
GETS REALLY TOUGH**



Patent
Applied for

ESCO WEAR CAPS CUT ADAPTER REPLACEMENT COSTS!

ESCO replaceable Wear Caps protect point adapters for long-wearing life.

Wear Caps are rugged, heat treated, high Brinell, 12M Castings, that slip over the top front of the adapter to protect the adapter from abrasive wear.

Replace the cap and not the adapter.

Designed specifically for large shovels, to cut adapter replacement in hard rock and other extreme conditions.



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Ask for ESCO Tested Points Catalog No. 187.**



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Pamak is now being used successfully as a collector in the beneficiation of such minerals as barytes, feldspar, fluorspar, hematite, hydrous magnesium oxide ores, kyanite, phosphate rock, and spodumene.

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3 hard-hitting models

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A combination of feeds, chucks and controls to match every stopping problem

Take your choice of three powerful Gardner-Denver stopers: the versatile, lightweight Model R68; the rugged, mediumweight Model RB94; or the heavy-duty Model RB104.

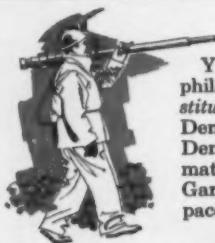
All three are outstanding in their class for high performance and low maintenance.

They're easier to handle . . . have balanced weight distribution. You may choose the feed control most suitable to your operation.

For roof bolting, specify a Gardner-Denver RB94 or RB104 roof-pinning stoper. They handle all operations quickly and efficiently—drilling hole, driving stud, tightening nut.

Choose the right stoper combination for your work

Model	R68	RB94	RB104
Hammer diameter	2 1/8"	2 3/4"	3 1/2"
Direct feed (steel)	X	X	X
Direct feed (aluminum)	X	X	X
Telescopic, direct feed (aluminum)	X	X	X
Reverse feed	..	X	X
Collared chuck	X	X	X
Tappet chuck	X	X	X
Push-button control	X	X	X
Rotary control	X	X	X
Stop rotation control	X	X	..
Roof-pinning adaptations	..	X	X



SETTING THE PACE

You'll find proof of our 100-year philosophy of growth—there's no substitute for men—in the Gardner-Denver stoper line. In 1906 Gardner-Denver men developed the first pneumatic up-hole drill—and ever since Gardner-Denver stopers have kept pace with mining needs.



100
1959
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EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

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Gardner-Denver R68



Gardner-Denver roof-pinning stoper



This impressive installation at Kiruna, Sweden, demonstrates a major benefit of ASEA Multi-Rope Friction Hoists: *low initial installation cost.*

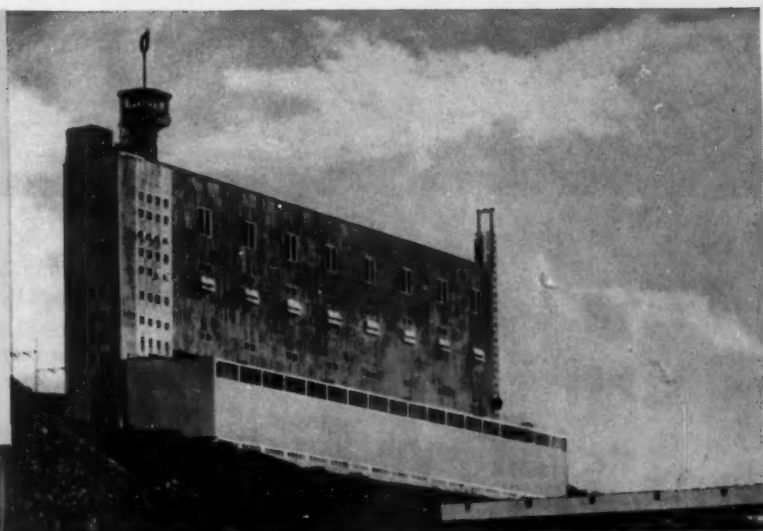
Each of these ASEA Hoists has a skipload of 22 tons and is designed for a depth of 1500 feet, maximum speed 2200 feet per minute.

At Kiruna, as in mining operations throughout the world, ASEA Multi-Rope Hoists prove less costly to operate, safer, and they reduce rope wear.

In the U.S. these advantages may be seen in the ASEA installations of National Potash Co. and

9 HOISTS IN ONE HEAD FRAME

**Total capacity:
4600 tons
per hour**



FULLY AUTOMATIC, the ASEA Hoists at Kiruna eliminate the employment of hoist men. At U.S. wage rates, assuming two-shift operation, this would mean a saving of about \$30,000 yearly for each hoist!

Write for illustrated literature on ASEA Multi-Rope Friction-Drive Mine Hoists.

ASEA

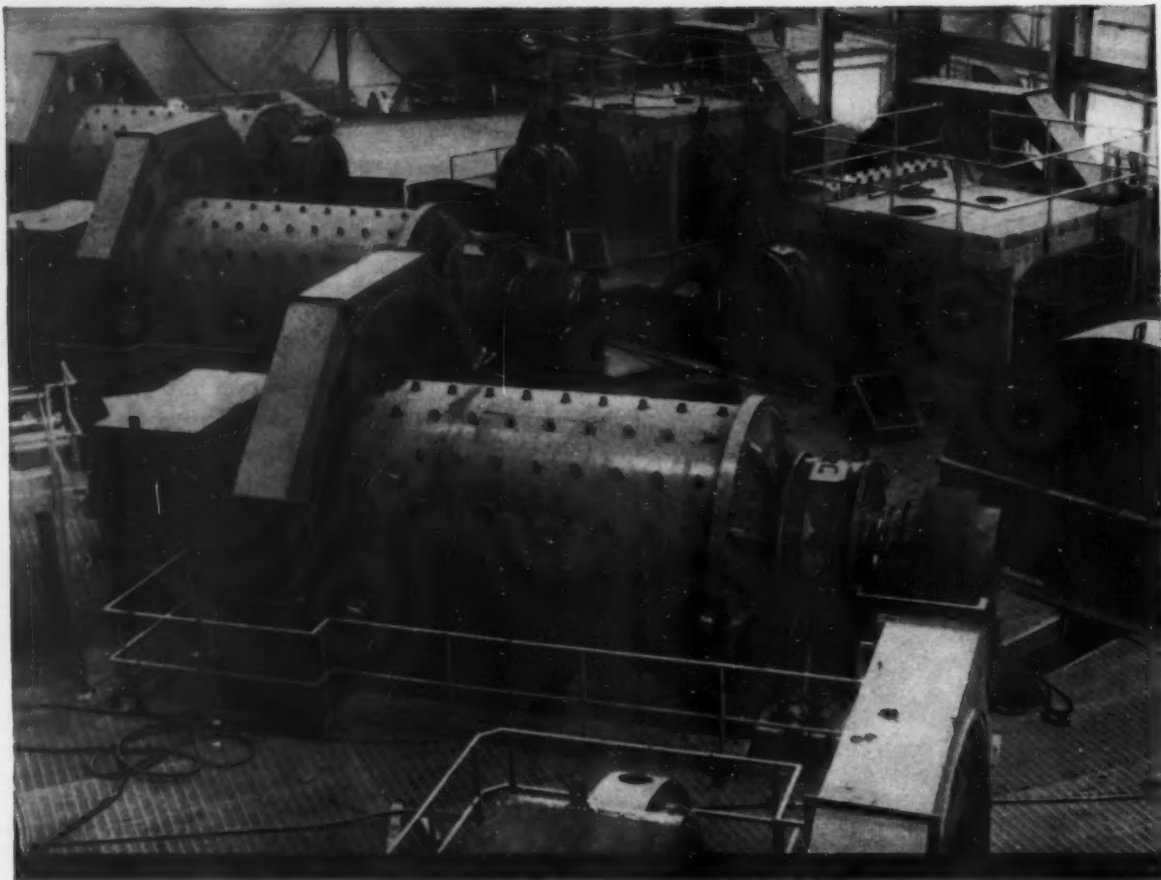
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for tough grinding problems **KENNEDY** **Ball and** **Rod Mills**

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- Welded and stress-relieved heavy steel plate shells
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- Self-aligning bearings with adjustable sole plates
- Positive "Ferris Wheel" lubrication of main bearings
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Mine owners enjoy three-way satisfaction from BUCYRUS-ERIES. You Can, Too

Like hundreds of mine owners throughout the country in pit operations like these, you can get complete satisfaction from fast-moving, economical, dependable Bucyrus-Erie 38-B and 51-B shovels and draglines. Look over these job pictures; check the material being excavated. Whether stripping overburden or loading ore, Bucyrus-Eries assure you:

High output, through swift dig-swing-dump cycles, smooth flow of power, accurate responsive control.

Low operating cost, proved by month after month of steady production with little downtime for maintenance. Parts are simple, large, few in number . . . engineered to work at capacity without overstress or strain. It all adds up to:

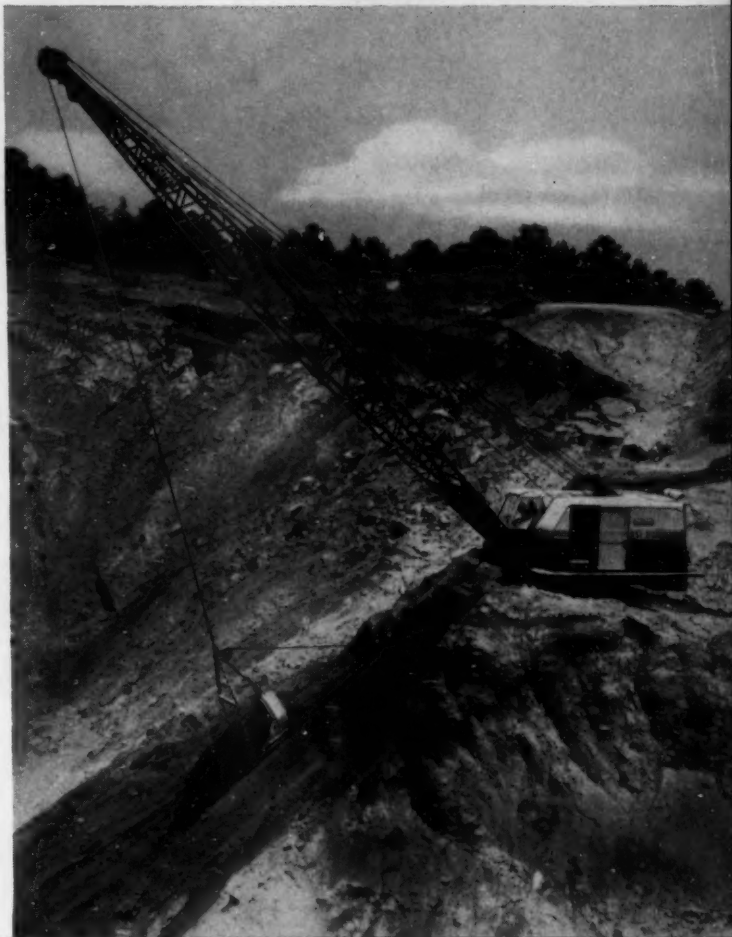
Dependability! Day after day, year after year . . . efficient working ability through careful balance of speed, power and weight.

Start now to enjoy this three-way satisfaction. Let your Bucyrus-Erie distributor give you complete information on these shovels and draglines.



A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN



AT CARTERSVILLE, GA., a 2-yd. 51-B dragline excavates Red Float iron ore for hauling to the Hodge Mining Co. mill.



NEAR BATESVILLE, ARK., Miller-McGee Manganese Co. uses a 1½-yd. 38-B shovel to load trucks for haul to manganese washer.



NEAR BUHL, MINN., Johnson and Moore get rugged pit performance from a 2-yd. 51-B shovel loading iron ore.



Mack Model LVX—22½-ton payload
rear dumper.



Mack Model LRX—15-ton payload
rear dumper.

Send a man instead of a boy!

Big yardages—smashing impacts—heavy hauls. That's when you need a truck with the guts and go of these famous super-capacity Mack off-highway dumpers. No doubt about it, the man-sized jobs are the Mack-sized jobs.

Check the specs with your Mack representative—but remember, Mack quality begins where specifications leave off. And be sure to ask him about Mack users—names, facts and figures—who are handling their big jobs with these profit-earning big Macks.

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For capacities of 30 tons or more where maximum flotation and traction are required, a full line of tandem rear axle Macks is available.

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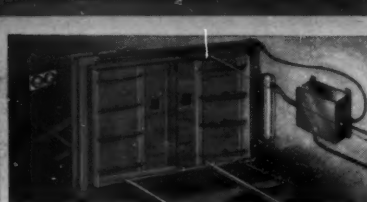
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MINING EQUIPMENT



Canton Automatic Mine Doors

The Automatic Door operates mechanically by weight of car on activating levers. Air power operation may be had where desirable. Operates at any trip speed. Two doors provide air lock.



Air Power Car Transfer

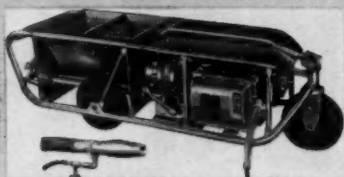
One man does the work of three and faster. Entire train loaded out on a single track. Expedites servicing cars to mucking machine.

Modernize
The
Cost-Less
Way for
QUICKER
PROFITS



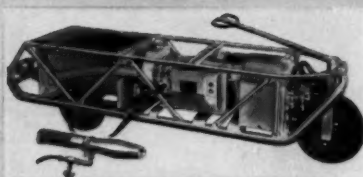
Manually Operated Car Transfer

No alterations to track—quickly installed and relocated—less rib to shoot than for jump switch—no hazards of cherry picker, antifriction bearings for easy hand operation.



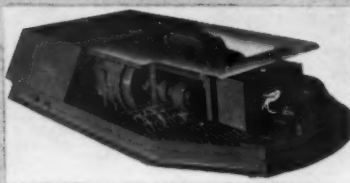
Little Chief for Wet Or Dry Dusting

Rubber tire model 22 1/4" high—skid model 18 1/4" high for shuttle buggies, belts or mine cars; track mounted for haulage roads. 34 to 60 lbs. dust per minute through 30 to 250 ft. of 2" hose.



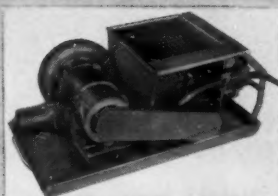
Little Chief Self Propelled Rock Duster

Hydraulically driven from a gear type pump directly connected to dusting motor. Travels up to 2 miles per hour. Wet or dry dusting. Height on tires 23 1/2". Turning radius, its own length.



Dustmaster

The track mounted Hi-pressure "Dustmaster" is the most powerful Duster ever built. Distributes dust to back areas 500 feet from haulway.



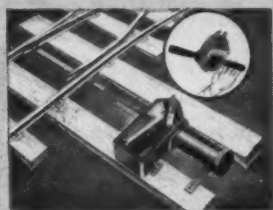
Mighty Midget Duster

Weights only 280 lbs. Easily moved on shuttle car. Hand cart available. Ideal for small mines—Inexpensive—capacity 7 tons dust per shift.



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Clean entire track area mechanically in one pass—no costly hand labor, no dozers or loaders required—hydraulic controls throughout. "Pays for itself in one sweep through mine." Now used in coal—iron—copper—lead—potash and salt mines.



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Restores insulation to original condition. Used with Canton splicers makes splice strong as original cable.



Canton Cable Splicers

Reduce down-time in splicing cable. Machine man should carry a packerful. Just pound around cable as shown and keep on working. No special tools.

Remember you can install a "Canton" now and pay us out of savings. Write for complete brochures. Please use street and zone numbers.



The American Mine Door Company

2071 Dueser Ave.

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Always DEPENDABLE For Moving Water and Tailings



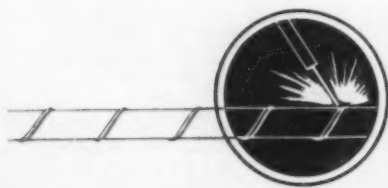
NAYLOR Spiralweld pipe is light in weight, but has what it takes to handle piping jobs in mining operations.

It's easy to handle and install even over rough terrain. The spiral-lockseam provides the strength and safety required for rugged service—whether operations call for moving water and tailings, hydraulic-

ing or handling air under pressure or ventilating.

You save time and work, too, when you use the one-piece NAYLOR Wedgelock coupling to make connections.

**For full details, write for
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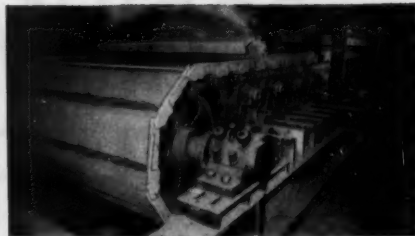


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Giant S-A AMSCO Feeder



S-A Stockpiling Conveyor System



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FOR EFFICIENT, PROFITABLE ORE HANDLING



At the left, ore is shown pouring into a ship's hold at an average rate of more than 4,000 long tons per hour from one of two giant STEPHENS-ADAMSON boom conveyors at Sept. Iles, Quebec. The STEPHENS-ADAMSON equipped ship-loading facilities believed to be the largest capacity in the world — handles as many as seven ore vessels a day and nearly 10,000,000 tons of ore a year.

STEPHENS-ADAMSON is proud to have been selected to equip the ship-loading facilities and other ore handling operations of the huge Quebec-Labrador project — one of the most far-reaching construction projects ever undertaken.



Write for
Literature on S-A
Ore Handling
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on stream at Aberdeen

expanded capacity for
growing markets by the *largest*
domestic producer of NaClO_3



The big news in sodium chlorate is TRONA's new electrochemical plant, now on stream at Aberdeen, Mississippi. This latest AP&CC facility provides faster and better service to the South's growing pulp and paper production centers, as well as further assurance of dependable sodium chlorate supply for other important markets in such fields as agriculture, uranium ore processing and solid propellant fuels. Aberdeen's readily expandable, initial capacity of 15,000 tons per year, added to the NaClO_3 production capability of Trona's Henderson, Nevada, plant makes American Potash & Chemical Corporation the largest domestic supplier of sodium chlorate...capable of meeting all demands from expanding commercial and military users. Further information on Trona's sodium chlorate service and production capabilities at Aberdeen is available from your nearest AP&CC branch office.



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NC-1 MINE
CAR TRUCKS



NATIONAL
CUSHIONING UNITS

*every day, every year more and more
mine cars and locomotives are equipped
with*

NATIONAL DEVICES

No matter whether you're considering the purchase of new mine cars or locomotives . . . or whether you're thinking of upgrading existing equipment *now* is the time to investigate the advantages of National devices.

For every day cost-conscious operators everywhere are switching over to National devices because they know they get more out of their equipment investment per workshift . . . per day . . . per year.

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY
Established 1868 Cleveland 6, Ohio

WILLISON AUTOMATIC COUPLERS RUBBER CUSHIONED UNITS NACO STEEL LINKS
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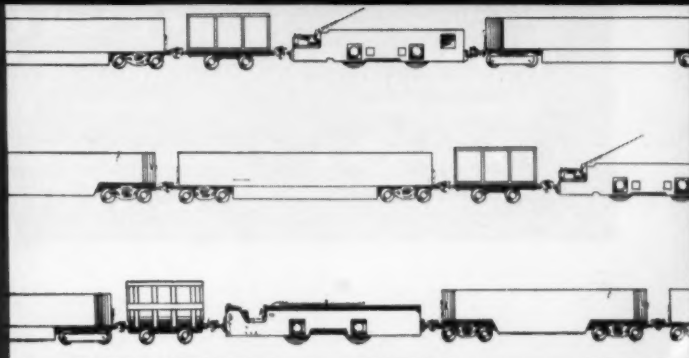
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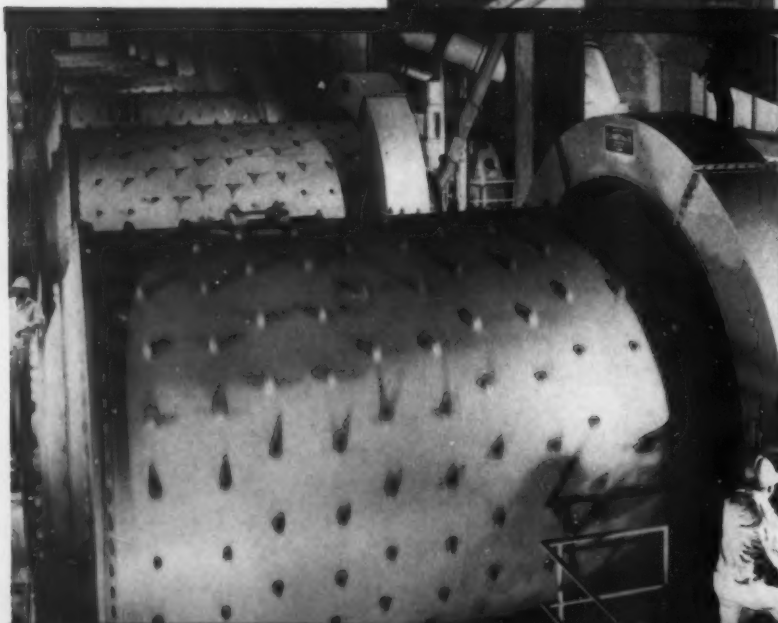
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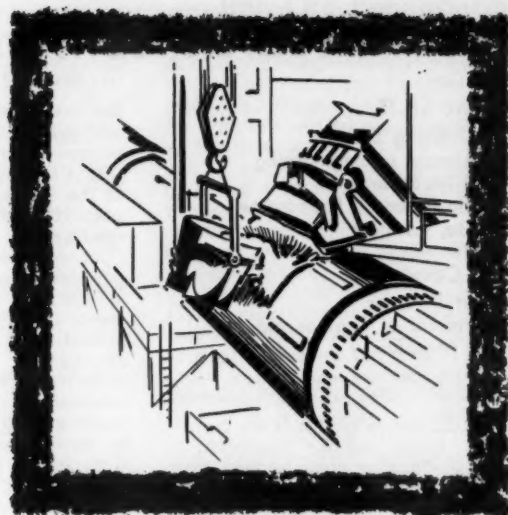
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TECHNOLOGY ADVANCES

in the Mineral Industry

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Iron Research Centers on Magnetite-Hematite

By The Staff

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Mesabi Range type iron ore beneficiation plant practice continues to progress. Notably achievements have been made in development of the taconite type of flowsheet for low-grade magnetite ores. In addition there has been in the last few years a considerable development in other flowsheets and techniques for treating non-magnetic or mixed magnetite-hematite ores.

GRAVITY SEPARATION: A great deal of information has become available on Russian concentrators operating on mixed ores. The Olenegorsk plant near Murmansk in the Kola Peninsula is of particular interest, as well as the great deal of work that has been done on the Krivoi Rog and Kursk deposits, where a variety of techniques have been used in production and in large-scale pilot operations. Russian practice on mixed magnetite-hematite ores has been, in general, to grind sufficiently to recover a magnetite concentrate and then to recover hematite by gravity separation on jigs, tables, or spirals. The Russians have developed special jigs for treating material finer than is normally considered for jig feed in North America. Very fast strokes are used, with experimental models operating as high as 1,500 strokes per minute. Feeds as fine as 10 mesh are being successfully treated in plants.

Relatively low recoveries of iron have been accepted in these Russian plants, while a great deal of effort

has been spent in studying flotation and magnetic-roasting as better alternatives to gravity recovery of hematite. A flotation section is being added to the Olenegorsk concentrator to replace the gravity section. Magnetic roasting is being studied in large-scale pilot operations in the south, and particularly at Krivoi Rog where fuel is relatively cheap. These developments have guided the planning for utilization of the mixed ores of Eastern Siberia. The conclusions appear to be remarkably similar to capitalistic conclusions; namely, that magnetic roasting gives best results but can only be considered where satisfactory fuel is cheap and plentiful.

HEAVY-MEDIA JIGS: The development in Sweden of the Stripa and Fagerberg "Heavy-Media Jigs" for treatment of mixed magnetite-hematite ores has aroused considerable interest. The medium is a bed of fine magnetite recovered from the ore as concentrate and used to separate the ore into two products in the Stripa machine or three products in the Fagerberg machine. With a long narrow trough and fast flow of heavy-media, these machines have a high capacity in the order of 100 tons per hour for a three-foot wide machine under ideal conditions.

FLOTATION: Recent work in Sweden, Norway, Germany, Russia, and the U.S. has shown that new developments in flotation make it possible to achieve grades of about 65 percent iron with recoveries of about 95 percent floating hematite from tailings of magnetic concentration of some mixed magnetite-hematite ores. These new flotation techniques, including multiple flotation at different pH levels, offer economical means of obtaining good performance with mixed magnetite-hematite ores. Proper preparation of the ore with efficient desliming at 10 microns, and the use of cation IM-11 and anion reagents (oxidized kerosene and a mixture of oxidized white spirits with acidulous pitch collectors) have been respon-

sible for a significant improvement in the possible results from flotation flowsheets on such ores.

The investigation of hematite flotation, carried out in Sweden, shows that flotation of hematite can be made without previous desliming using the

UMIX reagent—prepared from tall oil and a neutral oil, usually fuel oil No. 2, emulsified in water by means of an emulsifying agent, generally a water-soluble alkyl-arylsulphonate. Furthermore, it has been possible to separate phosphate from iron by first drawing the phosphate in slightly alkaline medium and floating the iron after acidification.

GRINDING: In addition to the publication of results from super-critical grinding in ball-mills, the main line of development has been the proving, in commercial use of the autogenous grinding mill for fine grinding of iron ores. The Aerofall mill, in particular, has been described several times and performance at the Benson Mines New York plant of Jones & Laughlin Steel Corporation has aroused considerable interest. The installation of a second Aerofall mill in this concentrator is an indication of significant advantages in the use of this type of mill for Star Lake Ore.

Of seven major iron ore concentrators, planned or being studied, most are carrying on pilot operations now or in the near future to determine the economic advantages to be gained by using Aerofall mills on their particular ore in place of conventional flowsheets utilizing crushers, rod-mills, and ball-mills.

DRY MAGNETIC SEPARATION: The combination of dry magnetic separation with dry grinding in autogenous mills seems a natural development, and pilot plant results to date indicate very interesting possibilities. In some cases, a completely dry flowsheet to produce at least the same grade and recovery as a "taconite" flowsheet is estimated to show about a 20 percent saving in operating costs.

The development of permanent magnet type separators at the Ontario Research Foundation with increased efficiency and relatively low operating costs enhances the possibility of completely dry flowsheets. The new fast eccentric drum separator is manufactured by Research Cottrell Incorporated and has proven itself during pilot plant tests on a variety of ores to be ideal for treatment of autogenous mill products. This unit is extremely flexible, and can be used with equal success as a cobber or as a concentrator, and is also effective when used for fine (minus-150 mesh) material. Extremely high grade concentrates of the order of 71 percent Fe have been produced by this separator from coarse grained magnetite ores, with corresponding recoveries of m.g.



MODERN LABORATORY of Ontario Research Foundation.

TABLE NO. I
Test Results For Dry Magnetic Concentration of Magnetite Specular Hematite Ore
at Ontario Research Foundation^{1, 2}

Product	Weight Percent	Analysis Percent			Distribution Percent		
		A-Soluble Iron	Magnetic Iron	SiO ₂	A-Soluble Iron	Magnetic Iron	SiO ₂
Feed	100.0	37.0	26.6	31.6	100.0	100.0	100.0
Coarse concentrate	33.0	67.5	67.5	5.1	60.3	83.9	5.4
Fine concentrate	4.2	70.9	70.9	1.3	7.8	11.2	0.2
Coarse tailing	49.3	20.2	1.8	47.6	26.7	3.3	74.3
Fine tailing	10.0	13.9	3.1	47.4	3.8	1.2	15.0
Secondary dust	3.0	13.9	3.1	47.4	1.1	0.3	4.5
Primary dust	0.5	25.0	8.0	40.0	0.5	0.1	0.6
Overall concentrate	37.2	67.8	67.8	4.8	68.1	95.1	5.6

1. Feed rate to mill, 5,750 pounds. 2. Liberation size of magnetite, 35 mesh.

TABLE NO. II
Screen Analysis of Products From Dry Magnetic Concentration Test at Ontario Research Foundation

Mesh-Size	Coarse Concentrate	Coarse Tailing	Mesh-Size	Fine Concentrate	Fine Tailing
-14 + 28	3.9	3.4	-65 + 100	4.2	8.7
-28 + 48	18.5	15.3	-100 + 150	3.8	6.1
-48 + 150	51.1	51.9	-150 + 200	7.6	11.5
-150 + 200	13.5	13.9	-200	84.4	73.7
--200	13.0	15.5			

netite Fe of 97-99 percent. See examples of test run flowsheet and results in Table Nos. I and II.

Published reports on the Otanmaki concentrator in Finland demonstrate the ability of dry magnetic separators to reject a true middling. In this plant a wet magnetic concentrate is dried and then concentrated on dry magnetic separators to bring the titania content down to a level which is not obtainable with wet separation on this ore.

DRY SEPARATION OF HEMATITE: The major interest in concentration of hematite and of mixed magnetite-hematite ores has resulted in significant improvements in dry concentration methods for recovering hematite. Electrostatic separation methods and high-intensity magnetic separators have been significantly improved. The Carpc development of an efficient electrostatic technique for mixed ores is particularly interesting.

The new models of high-intensity magnetic separators for recovery of hematite, in particular the German models, are giving considerably higher

tonnage capacity per dollar invested than has been the case in the past.

The fact remains that the success of both electrostatic separation and high-intensity separation depend strongly on careful sizing of the feed for best results and are structure sensitive.

At the Ontario Research Foundation investigations have been conducted over the past few years on the separation of specular hematites in low intensity magnetic fields and in alternating fields, by taking advantage of their comparatively high coercive force. While these methods have worked well to date, high capacities are difficult and expensive to obtain. Further work is continuing on improvement of methods.

The combination of magnetic roasting with dry magnetic concentration is also being pursued at the Foundation and an experimental flash magnetic roaster has been in operation for over one year. The aim of this equipment is to treat at a high capacity fine mixed tailings or hematite ores to convert to magnetite feed suitable for

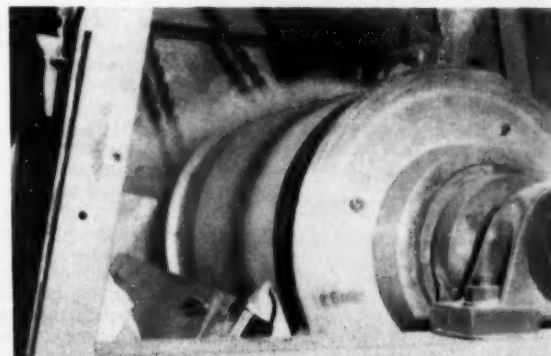
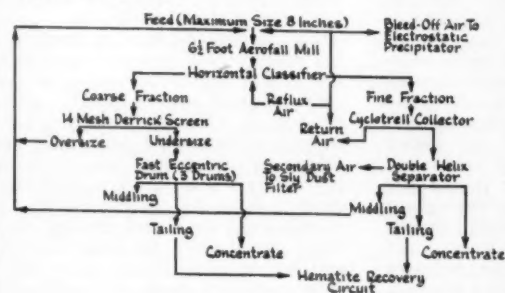
dry magnetic separation. It is possible to feed air borne fine material or to feed fine material from a hopper to the roaster. Natural gas is used both as fuel and as a source of reducing gas by cracking. Results obtained to date are encouraging but improvements in fuel economy is required.

Other new experimental work on magnetic roasting is being done in Australia where, as a result of the work of the joint laboratories of the Commonwealth Scientific and Industrial Research Organization and Melbourne University Mining Department, a pilot plant has been set up at Whyalla, South Australia. This operation is shaft roasting of low grade hematite (martite) by CO + H₂ with subsequent ball milling and wet magnetic separation followed by de-watering and pelletizing. This furnace operates continuously at two tons of product per hour and heat exchangers are used for fuel economy. Details on results obtained have not been published.

DIRECT REDUCTION OF IRON ORE: There has been a renewed interest in the possibility of reducing ore to metal at the mine and shipping a product suitable for remelting in steel-making furnaces. Outstanding developments in the last year have been the announcement of successful operation of the R-N process in Alabama and the profitable commercial operation in the large sponge-iron plant at Monterrey, Mexico making 200,000 tons per year of metal. Other processes are also being investigated on the pilot commercial scale and results should soon be available from such processes as the Strategic Materials-Koppers process, the Hydro-Carbon H-Iron process, and the McDowell process.

In most cases, capital investment in these processes appears to be in the range of \$65.00 per ton-year of metal capacity. Production costs appear to be in the neighbourhood of \$45.00 per ton of metal. There is no real competition between the different

Flowsheet For Dry Grinding and Dry Magnetic Separation of Coarse Grained Magnetite Specular Hematite Ore By Ontario Research Foundation



FAST DRUM PERMANENT MAGNET separator has many advantages: low operating cost, can be used as a cobber or concentrator, treats fine material, and makes a high grade concentrate.

methods, since each is dependent on a supply of cheap fuel and the required fuel is different in each case.

Considerable work has been done and is still going on at the Ontario Research Foundation in direct reduction. The Direct Steel Process developed here consists of reducing a layer of highly beneficiated ore continuously with a rich reducing gas. The reduced layer or slab is rolled hot in atmosphere directly to full density steel sheet. This process is designed to produce a finished steel sheet directly from ore without melting. The Jet Smelting Process, which is still in the experimental stage, produces molten iron directly from fine iron ore in one step. Heat is supplied by burning natural gas with oxygen and the reducing atmosphere by cracking of natural gas. Another process which has been operated on a laboratory scale uses lump ore, minus $\frac{1}{8}$ -inch, plus $\frac{1}{4}$ -inch feed which is reduced in a shaft by gaseous reduction and subsequently melted in the same apparatus. The product is a molten pig iron. Only limited tests have been made on the last method.

Interest in the evaluation of the reducibility of ores, pellets and sinter has increased. Tests for reducibility are of great importance in assessing the reduction rate in direct reduction processes and blast furnaces. Activity

in this field accents the growing interest in direct reduction methods and concern for improvement of blast furnace efficiency.

FUTURE RESEARCH AND DEVELOPMENT IN IRON ORE BENEFICIATION: Continuing work in Sweden is being directed to flotation of coarser grinds of hematite ores.

Research studies in Russia are progressing with treatment of mixed and low grade ores by gravity, flotation, magnetic concentration, and magnetic roasting. A great deal of work is being done on comparing the relative merits of the different methods for recovery of iron from several large ore bodies. At the same time laboratories, pilot plants, and commercial plants are continually testing various flow sheets and improvements of methods are being sought.

The further development of dry magnetic separators is concerned with improving concentration on finer feeds. Higher frequencies and field strengths are being tried.

In the dry concentration of hematites coercive methods will receive further attention and a new approach to electrostatic separation is in the preliminary stages.

Attempts to develop cheaper magnetic roasting processes continue. In addition to work on the Flash Magnetizing Roaster another new idea for



EXPERIMENTAL FLASH MAGNETIC ROASTER for converting fine hematite to magnetic feed for dry separation.

magnetizing roasting will be tested at the Ontario Research Foundation in 1959.

It is probable that in the next year commercial adoption of one or more direct reduction processes will be seen.

Research, New Blasting Agents, Electric Wheels Speed Mine Output at Lower Cost



By RICHARD M. STEWART
Assistant Director Mining Research
The Anaconda Company
Butte, Montana

Key words to describe mining trends in 1958 were mechanization, instrumentation, automation, and research. Most mining companies have made progress in these fields in order to offset reduced metal prices. Many

companies use data processing machines and analog computers to perform many clerical jobs, such as payrolls, monthly statements, inventory control, ore reserve estimates, and timely operating statistics for mine management.

Repetitive or continuous processes, such as haulage, hoisting, pumping, and ventilation, are being controlled by mechanical, hydraulic, or pneumatic systems combined with electronic apparatus. Interlocking centralized controls with monitoring devices, such as closed circuit television, photoelectric cells, limit switches, radiation counters, proximity switches, and various chemical analyzers, make labor-saving, automatic control more accurate and positive than manual control.

Bulk mining methods handling tremendous tonnages on surface and underground have yielded the lowest unit costs through use of larger and faster equipment. Tons mined per man shift continue to rise throughout the industry; however, capital investment in the equipment each miner uses is also rising. The mining industry is undertaking more applied research into the unit operations of mining and processing in order to carefully evalu-

ate present methods and equipment and compare performance of alternate methods and equipment. These research studies are resulting in standardized procedures leading to lower production costs.

While the progress is more spectacular in open pit mining and block caving, there are many important developments in small selective mines. An excellent example is the rapid development of horizontal cut and fill stoping in place of timbered stoping methods. Hydraulically placed fill provides much better ground support than timber and is emplaced in a fraction of the time. In many cases, the fill can be placed in a few hours, so that the stope never goes out of production; thus, a few cut and fill stopes can produce the same tonnage as many timbered stopes. The saving in labor and material is obvious.

Pneumatic sand stowing equipment has also evolved recently, permitting use of this alternative means of providing ground support quickly and inexpensively. Other methods of ground support include: rock bolts (slot and wedge, expansion shell, and cemented types), steel sets (fixed and yielding types), concrete (pneumatically or mechanically emplaced through pipelines), pre-stressed concrete members and temporary hydraulic props, yieldable cantilever posts or roof jacks. Most of these are fairly recent developments which, when coupled with

the increasing technology of rock mechanics, will yield new concepts of ground support in the near future.

In considering underground excavation trends, such recent advances as the continuous miners and improved rotary drilling practices indicate that application of these techniques to harder rock will be achieved in the near future. Consider the effectiveness of tungsten carbide in hard rock, then recall recent announcements of cutting materials such as borazon, many times harder than tungsten carbide, approaching diamond.

An outstanding achievement over the past few years has been the driving of several miles of 25-foot 9-inch-diameter tunnel in shale at the Oahe Dam in South Dakota. There a conveyorized Robbins machine bored at rates as high as 12 feet per hour using the principle of cutting a narrow kerf in the shale, then crushing most of the rock to the void. With an improvement in the method to allow cutting similar kerf in hard rock, the crushing principle would be effective in any ground. The recent success of roller-type rotary drill bits in cutting kerf for sinking shafts would certainly suggest that the problem should be solved fairly soon.

Surface Mining

ROTARY DRILLING: The largest horizontal rotary drill was recently tested at Peabody Coal Company. This machine, manufactured by Reich Bros. Manufacturing Company of Terre Haute, Indiana, can drill a blast hole, using either auger or roller bits. Hole depths of 60 feet have been drilled through hard limestone. The drill is crawler mounted and self propelled. A hydraulic system is used to lift and stabilize the unit in drill position on four jacks.

BLASTING: The extensive use of ammonium nitrate-fuel oil mixtures, as well as nitro-carbo-nitrate explosives, has continued where blast holes are dry. However, significant advances have been made recently in adapting these explosives to wet holes. The Hanna Coal Company at Cadiz, Ohio, has successfully packaged ANFO in waterproof bags. The company's extensive research program has aided its development of a boosting practice using detonating cord wrapped around a bag of 2 percent FO-AN mix.

The United Electric Coal Company packages ANFO in a Bemis Bag consisting of three layers of paper lined with polyethylene film. Wet or dry blast holes 9 inches in diameter are loaded using these bags. An 8 mil polyethylene bag filled with shredded newspaper is dropped to the bottom of dry holes to act as a shock absorber. Then the charge is dropped into the holes. Wet holes do not require the shock absorber. The effectiveness of the bags is indicated by the fact that

wet holes have been loaded and left for four days before being shot with no apparent loss of blasting efficiency.

A major breakthrough in blasting has been achieved at Iron Ore Company of Canada, with the assistance of Canadian Industries Ltd. and Dr. Melvin A. Cook of the University of Utah. They have developed a water-compatible ammonium nitrate-TNT slurry explosive with 1.7 times the density of ammonium nitrate-fuel oil mixtures.

The cost of the 65 percent AN, 20 percent TNT, 15 percent water slurry is also approximately 1.7 times that of the conventional AN fuel oil mixture. However, the detonation rate of slurry is twice that of ANFO and the explosion pressure is approximately three times that of ANFO mixtures. Slurry explosives will not replace ANFO explosives, but they will increase the field of utilization of fertilizer grade AN to include wet holes and hard rock. The techniques required in batching and mixing slurry explosives indicate that it will probably be supplied by the explosive manufacturers rather than mixed at the mine on a "do-it-yourself" basis.

LOADING: In open-pit mining operations, loading is usually done with large, electric, crawler mounted shovels. The outstanding developments have been in size, power, speed, and method of control. The optimum size varies with the material being loaded and the layout of the pit. Shovels of five- to 13-yard capacity are being used. Control of the different motions varies with the type of drive. In engine-powered units, both friction brakes and magnetic clutching systems are in use. Friction brakes are controlled by either hydraulic or pneumatic systems. In all-electric units, the most common control system is Ward-Leonard. Regenerative action of the motors is a common system used in braking. Automatic centralized grease lubrication systems and the use of copper lines and grouped fittings leading to hard-to-reach points are being used more widely.

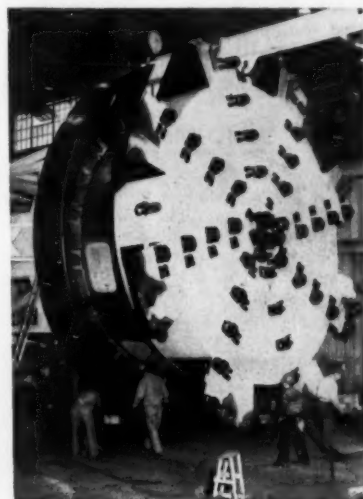
In stripping operations, larger and faster equipment continues to reduce the cost per cubic yard. Hanna Coal Company's "Mountaineer" recently had a 66-cubic-yard bucket installed. This shovel has a 150-foot boom and a 92-foot dipper handle, making it possible to dig a 90-foot face and stack to a height of 100 feet. The bucket digs 90 tons of rock and swings to discharge this overburden 290 feet away. The complete operating cycle is performed in 45 seconds. The rated horsepower of all motors totals 12,000. The cost of the machine was approximately \$2,600,000. It is operated by one man with the assistance of one oiler who checks the performance of the automatic lubrication system and makes minor repairs. During continuous operating periods, the ma-

chine can handle approximately 7,200 tons of overburden per hour.

LOADING AND HAULING: The world's earth moving record was established on May 16, 1956, with a load and haul method at the Oahe Dam project in South Dakota, Western Contracting Corporation, during a 24-hour period on two 10-hour shifts, moved 145,000 cubic yards of earth. Loading equipment included three 191-M Marion shovels, one with a 14-cubic-yard dragline bucket and two with 13-yard dippers. Other shovels included a 151-M Marion dragline with 8-yard bucket, and a Manitowoc Model 4500 swinging an 8-yard bucket. Haulage equipment included 30 LLD 50-ton end dump Euclid trucks powered with two 300-horsepower Cummins Diesels; 25 Euclid 25-ton bottom dump trucks with GMC Diesels; and 11 Mack 30-ton end dump trucks with Mack Diesels.

More recently, the Western Contracting Corporation has been stripping the upper benches of Kennecott Copper Corporation's Bingham Pit in Utah. Two 191-M Marion electric shovels with 13-yard dippers are moving 2,000 cubic yards of waste per hour. A fleet of 29 LLD 32-cubic-yard, 50-ton Euclids hauls the waste with the assistance of "Eucnick." The shovels make three passes in 45 seconds to load one of the 32-yard trucks.

The unique feature of this operation is Eucnick, a massive, 18 wheeled, end dump truck capable of carrying 110 cubic yards heaped, but more conservative loading limits it to six passes of the 191-M shovel which loads approximately 70 yards. Its two Cummins Diesel engines, rated at 430 horsepower each at sea level, are delivering about 410 at 8,000-foot elevation. It is reported that twin, 500-horsepower engines are being



TUNNEL DRILLING MACHINE will cut a 29.5-foot diameter hole through shale at speeds up to 12 feet per hour.

considered to improve the truck's performance at high altitude.

Western has established 35-foot bench heights for the stripping operation and has modified two Bucyrus Erie 50R rotary drills by extending the mast heights 12 feet, thereby permitting a single drill stem to bottom out the blast holes. Hughes W7R tricone bits, 12½-inches in diameter, are used in the quartzite and limestone overburden.

Off-highway truck tires have been a limiting factor in large truck design. There is need for larger low pressure tires capable of carrying bigger loads, yet withstanding the heating, rock bruising, and cutting that these tires are subjected to in mining. These problems have been partially solved with the trend towards stronger and lighter nylon carcasses, together with deep-tread construction. A trend is also evident toward extremely large, low pressure off-highway tires, for trucks and scrapers. These range in size from 33.5 by 33, up to projected sizes as large as 44.5 by 45.

Several tractor-trailer type rock trucks are being manufactured in sizes up to 80 tons. These units may dump their loads by side tilt, rear dump, or bottom dump.

Nchanga Consolidated Copper Mines Ltd. in Northern Rhodesia recently commissioned a 408-ton bucket wheel excavator which mounts eight, 0.45-cubic-yard-capacity buckets on a wheel 20 feet 4 inches in diameter. This unit is rated at 1,600 yards per hour of loose material when operated at a top speed of 72 buckets per minute.

When the bucket wheel excavator started, there were 12,500 feet of 48-inch-wide conveyor belting traveling at 800 feet per minute. A crawler mounted boom stacker is used for disposal of the overburden. This 388-ton machine accelerates the waste rock so that the stacker throws the rock at a velocity of 1,120 feet per minute. The 164-foot stacker discharge boom can be raised to build a dump 56 feet high.

HAULAGE: One of the most significant developments of the year was the 130-ton-capacity scraper built by R. G. LeTourneau Inc. for stripping and earth moving. The unique feature is the all-electric motor wheel drive. The unit is powered by two 600-horsepower Cummins Diesel engines directly connected to large dc generators and small ac generators. The dc current is conducted to eight 150-horsepower electric motor wheels, while the ac current powers auxiliary motors for control.

This 1,200-horsepower Diesel electric unit is similar in many ways to a railroad locomotive. Yet it is mounted on eight low pressured tires 89 inches in diameter, rated at 48 ply each. The electric wheel drive eliminates many conventional mechanical elements, such as torque converter, transmission,

differential, and drive shaft.

Scrapers of 130 ton capacity are currently working at the new Washington International Airport near Chantilly, Virginia.

The Caterpillar Tractor Company, has been testing General Electric Company's electric motor wheels for two years. These wheels are rated at 380 horsepower each.

These large bowl scrapers are being used more extensively for mine stripping, particularly in conjunction with heavy crawler tractor rippers. A new technique of rock breaking has been announced in the electromagnetic fracturing method. This system employs a tractor-mounted coil which transmits alternating magnetic fields which in turn cause tensile failure of the rock due to localized differential expansion. The fractured rock can then be stripped using bowl type scrapers.

SKIP HOISTING: Kennecott Copper Corporation is completing construction of a skip installation at the Liberty Pit in Nevada. The 1,360-foot skipway is inclined at 19°. The 25-ton skips will raise the ore 435 feet at a rate of 1,000 tons per hour. The system has been designed to handle boulders as large as 4 feet by 4 feet by 6 feet. The elements of the system were acquired in the purchase of Consolidated Copper Mines. Kennecott is also installing a skip hoist at Chino Mines Division, New Mexico.

Some skip hoisting installations are being considered utilizing 40-ton skips. Designs for these systems feature bottom dumping or tipping type skips.

Underground Mining

TUNNEL DRIVING: A large train loader, consisting of three 75-ton railroad cars, has been developed by Peter Kiewit Sons Company, San Francisco, for use in the Feather River, California railroad relocation tunnels. Two train loaders are used with an Eimco 105 in loading out 12-foot rounds in a heading 21 feet wide by 30 feet high. About 400 cubic yards of muck are developed in each round blasted. An Eimco 105 rocker shovel loads this rock into a hopper on the end of the train. A scraper, 88 inches wide, is used to distribute the rock along the train. A 100-horsepower scraper hoist is mounted at the end of the train loader. Advances average approximately 50 feet per day.

Similar interconnected railroad cars had previously been used for tunnel driving by the Anaconda Company at the new El Salvador Mine of Andes Copper Mining Company in Chile. Mr. E. R. Borchardt, Director Mining Research for Anaconda, consulted in the design of both Andes and Kiewit installations. At El Salvador, a record of 62 feet of advance per day was achieved in a tunnel 14 feet wide by 17 feet high.

The drill jumbo used by Kiewit

mounts 12 drills on four levels, 11 3¼-inch drifters and one 5½-inch drifter for the burn cut. The drilling platforms cantilever out from the 44-foot jumbo car for some 20 feet. The jumbo is counterweighted on the opposite end by an air receiver. All drills are mounted on remote controlled hydraulic jibs.

SHAFT SINKING: Excellent shaft sinking progress was achieved by Shattuck Denn Company, at its Big Indian district mine in Utah. Three men per shift worked in the bottom of the 7- by 14-foot rectangular shaft. During a 25-day period they sank 392 feet, an average of 15.7 feet per day. Mechanized sinking equipment, including a Cryderman mucker, rectangular safety bucket and crosshead, and a four drill jumbo, was engineered by Shaft and Development Machines, Inc. of Salt Lake City, Utah. The pneumatic clam shell Cryderman discharged into a rectangular 70-cubic-foot sinking skip. Mucking time varied from 1.5 to 2 minutes per skip. The sinking jumbo was designed to collapse so that it will pass through a 48-inch opening. Four Atlas Copco "Tiger" drills with rectangular legs were utilized. The 300-pound pull of the retractable airleg eliminated miner fatigue normally associated with conventional sinker drills. Retractable airlegs for sinking were first used at Anaconda's Darwin mines, in California, in 1951. Later the idea was used at Butte, Montana, in sinking the Modoc shaft. The collapsible jumbo using the retractable airlegs should prove to be a valuable tool for sinking in small shafts or winzes.

The M. A. Hanna Company is sinking a 20-foot-diameter concrete circular shaft at Iron River, Michigan. Walsh Construction Co. was given the contract to sink the Homer-Wauseca Shaft in June 1957. When completed, the shaft will have a depth of 2,740 feet with the lowest station on the 2600 level. A total of eight stations and seven pockets comprise the shaft auxiliaries. Drilling is done with a four-machine jumbo, mounting CP-60 power-feed drifters with 10-foot drill steel.

A normal round consists of 70 holes, and the average depth broken per round is 8 feet. Approximately 180 cubic yards is broken. Mucking is done with an Eimco 630 tractor mounted overshot shovel which discharges into a 3¼-cubic-yard bucket. Two sinking buckets 5 feet in diameter by 5 feet high are used. The drilling, blasting, and ventilating part of the cycle requires approximately four hours.

Steel forms for concreting were supplied by Blaw-Knox Company and 30 feet of shaft is poured at one time, using a 2-cubic-yard bucket. Concrete strength must be 3,000 pounds per square inch, or stronger.

A Koepe-type hoist will be installed for the operating shaft. Three Nord-

Mining

berg-Koepe hoists have been erected over the circular shaft. Two rock hoists are driven with two 700-horsepower General Electric synchronous motors, and the cage hoist will have a 500-horsepower motor. General Electric has built an automatic hoisting programming control unit. A maintenance man will be employed rather than a hoisting engineer. He will spend part of his time at the control panel in the hoist room. This panel includes a memory-type fault finder which warns the maintenance man in case of overload, hot bearings, or low voltage. If the problem is not corrected in a short period of time, the fault finder stops the hoist. The memory element of the fault finder indicates the origin of the trouble.

Merrimac Mining Company, near Sullivan, Missouri, is sinking a 3,000-foot shaft for iron ore. In this joint operation, St. Joseph Lead Company, and Bethlehem Steel Company are sinking a shaft 22 feet in rough diameter, with finished concrete 19 feet 1-inch in diameter. A six-machine jumbo is used to drill an 11-foot round. An Eimco 630 mucks into a 4-yard bucket. Advance per week has averaged 56 feet.

Climax Molybdenum Company in Colorado is sinking a 700-foot circular shaft 19 feet 6 inches in diameter inside concrete. This internal shaft collars on the Storke Level. Stations will be cut 300 and 600 feet below the collar. A four-boom sinking jumbo using 3½-inch leyners is used to drill 10-foot rounds. Mucking is done with an Eimco 630 discharging into a 3-ton bucket. A Bain type work deck is used for concreting.

Recently Hartebeestfontein Gold Mining Co. Ltd., South Africa, developed a new shaft sinking carriage. It was designed to impart vertical, radial, and circumferential movement hydraulically to a pneumatically operated cactus grab of up to 30-cubic-foot capacity. The new carriage was designed for a loading rate of 120 tons an hour using a 20-cubic-foot grab. A complete loading cycle is achieved in about 25 seconds.

Mindola No. 2 shaft is being completed on the Copperbelt in Northern Rhodesia by Rhokana Corporation Limited. A cage raising system was used in mining an 8-inch-diameter pilot raise which was subsequently enlarged by slashing to full size. The project was attacked on several levels and the enlarging was done by both raising and sinking methods. The finished concrete shaft is 24 feet in diameter. Hoisting facilities are being installed for handling 300,000 short tons of ore from the 3,000-foot level.

A 123-foot-high circular concrete headgear will support a Koepe friction winder. Two 15-ton skips will operate between the 3,100-foot level and the surface tippie. The winder will be fully automatic and will be driven by two 2,100-horsepower ac motors

through a reduction gearbox. The method of automatic control is briefly as follows: When the empty skip approaches the bottom station, the hoist starts decelerating at a pre-determined point in the shaft and finally brings the skip to a stop—within inches of the loading point. A pneumatic cylinder then pushes a loading flask containing a weighed quantity of ore into the shaft and over the skip. At the same time a door in the bottom of the flask opens and allows the ore to discharge into the skip. When empty, the flask is withdrawn from the shaft and the skip is hoisted. Slowing down, stopping, loading and unloading, starting and accelerating to a maximum rope speed of 3,000 feet per minute requires a cycle time of 43 seconds.

An unusual feature of the shaft equipment is the use of rope guides instead of fixed guides. Since the circular shaft was concrete lined, no supporting cross beams are necessary; so the practice of weighted rope guides to reduce capital expenditures was adopted. Each skip will be guided by four 1½-inch-diameter wire ropes freely suspended in the shaft from heavy beams located high in the headgear and tensioned with approximately 8 tons of cast iron weights at the lower end of each rope.

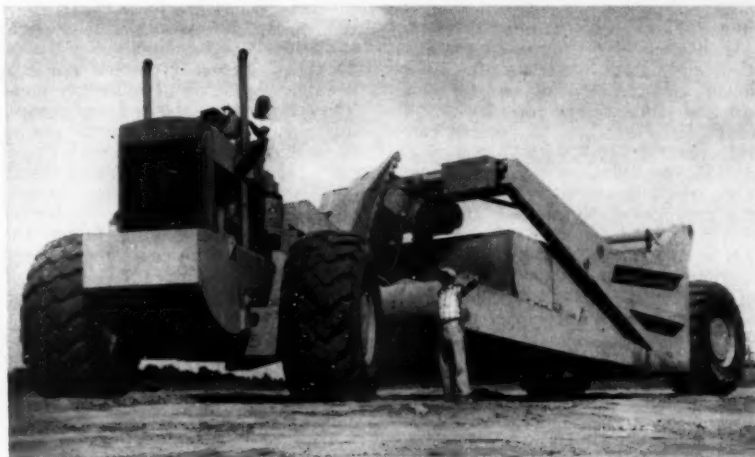
RAISING: A drilling platform for raising operations has been introduced by Alimak Verken of Sweden. This drilling platform elevator permits driving raises to great heights with substantial labor savings. The raising elevator permits increased distances between operating levels, since miners no longer need to climb ladders which can be damaged or destroyed by falling rock. Instead they ride up through the raise on the compressed air driven elevator. The elevator operates on a rack-equipped guide rail, available in one or two meter lengths, which are fastened to the rock by expansion bolts. Guide rail sections are installed

to the face of the raise and are left during the blast. Water and compressed air conduits are incorporated in the guide rail so that the raise can be ventilated after the blast. The miner reenters under the protection of a steel bonnet. The miner's drill and tools are mounted on the elevator and a communication system is included between the platform and the drift floor. When the raise is completed, the guide rails are easily dismantled to be used again in a new raise. A special rubber tire mounted carrier is used to transport the elevator equipment in the mine.

The cage raising method was employed at the AS&R Irene Shaft at Leadville, Colorado. The 492 feet of raise that was driven with the work cage required 75% working shifts, averaging 6.5 feet per shift. The hexagonal work cage was 9½ feet in height and 5½ wide. The all-steel unit weighed 1,910 pounds. It was suspended on a ¾-inch 18 by 7, pre-formed, non-rotating wire rope which passed up to the 1,000 level hoist through a 3-inch diameter pilot hole. The single-drum, geared hoist was remote-controlled from the work cage.

UNDERGROUND BLASTING: One of the most significant developments for future mining has been the series of underground nuclear explosions detonated at the AEC Nevada test site. Five shots, varying in size from the equivalent of 80 tons to 23,000 tons of TNT, were exploded with no significant escape of radioactive particles or gases. The radioactivity was confined in a spherical molten rock shell formed around the shot. Moments after the blast, the radioactive rock resolidified. None of the isotopes are soluble in ground water or weak acids.

It has been determined that the 1.7-kiloton blast formed a spherical void 110 feet in diameter which lay within a sphere of crushed rock 260



ALL ELECTRIC MOTOR WHEEL DRIVE powers the world's largest scraper. Two 600-horsepower Cummins Diesels drive direct current generators.

feet in diameter. Approximately one minute after the blast, the cavity collapsed and caving action then progressed slowly upward to 386 feet above the device. In the 23-kiloton blast, the void was estimated to have a 270 foot diameter and the subsequent collapse and caving action progressed vertically 835 feet to surface.

It has been estimated that rock can be caved by this method at a cost of approximately 5¢ per cubic yard. If this is true, the method may be attractive as a means of primary blasting for extensive stripping operations.

A second possible application is to shatter rock for subsequent leaching. The leach solutions would be accumulated in the hemisphere remaining after the initial void collapsed. The pregnant solutions could be drained by diamond drill holes and pumped to a hydrometallurgical plant for recovery of values.

Costs of nuclear blasts do not vary directly with the strength of the explosive. A small, one-kiloton nuclear device detonated underground costs approximately \$500,000, while a large 100-kiloton nuclear device would cost approximately \$1,000,000. Also, multiple shots of a given size can be fired at lower cost than a single shot.

This past year has also seen some developments in more conventional underground blasting. The Eagle-Picher Company's Tri-State mines have successfully used prilled ammonium nitrate for underground blasting in holes 2½ inches in diameter by 10 feet deep. Pre-waxed cylindrical paper shells 1½ by 16 inches were loaded with a 6 percent fuel oil-ammonium nitrate mixture. These AN cartridges were produced by Eagle-Picher at less than \$8.00 per 100 pounds.

A hole was loaded as follows: A 10-foot length of 50 grain "Primacord" was laced through a 60 percent dynamite booster cartridge and loaded into the end of the hole; then two 16-inch sticks of AN were slit and tamped into the hole; this was followed by an 8-inch stick of 60 percent dynamite; then alternately two sticks of AN followed by one stick of dynamite—all slit and tamped. The ratio by weight of prilled cartridges to booster cartridges was 4.3 to 1, with 9½ pounds of combined explosives used per hole. This was approximately the same as the amount of 40 percent ammonia dynamite used per hole before prilled AN was introduced in the mine.

They realized explosive cost savings of approximately 20 percent. In order to improve the sensitivity of the AN-fuel oil mixture, uncoated or Petroag coated prills proved better than those with the 4 percent diatomaceous earth coating.

HAULAGE: Underground haulage layout and equipment is being modernized to permit larger and faster ore trains. At Republic Steel Corporation's

Raymond mine, where extreme grades of 5 to 7 percent have influenced the design, notable progress has been achieved. If the same principles were applied to normal haulage grades, we should see a revolution in underground railroad equipment. They use 25-ton rotary dump cars with 40-ton tandem locomotives. This equipment operates at speeds up to 20 miles per hour. One development that has paid off is the use of 90-pound welded rail. This practice saves the expense of splice bars, bolts, rail bonding wire, and provides a better ground for the 250-volt dc trolley system. The labor cost for track installation is the same as for standard practice, but the material cost is cut in half. Rail ends are beveled at 45° prior to welding, then a ¼ rod of No. 22 N/n bronze is used with an anti borax flux. A No. 30 Ox weld tip, type W7B, is used for cutting and welding. The rotary car dumper is monitored by a closed circuit television system. Equipment maintenance costs have been cut by having worn 14-inch car wheels rebuilt and hard-surfaced by Sanford-Day Iron Works.

TRACKLESS HAULAGE: For several years electric trolley trucks have been operating in a salt deposit underneath the city of Detroit. Here the International Salt Company uses 21-ton bottom dump trailers pulled by rubber-tired electric tractor units. Storage batteries are used to power the vehicle under the shovels. These haulage vehicles were dismantled and lowered through small shafts to the operating level then reassembled. The units have been in operation over an 11-year period. The operating and maintenance costs have been very low. The underground haulage roads are essentially level.

The Riverside Cement Company in Crestmore, California has also had excellent experience with electric trucks underground. They use 803 B Kenworth 30-ton trucks with a 350-horsepower, 550-volt locomotive type electric motor operated by overhead trolley wires. Limestone ore is hauled 1½ miles up an 11 percent grade at average speeds of 12 miles per hour. Their experience shows lower operating and repair costs on electric equipment than they have had with Diesel units. The tire costs on electric trucks have been less than half those on conventional Diesel-torque converter units. For maneuvering under the shovels, an electric cable reel is used which will hold up to 400 feet of cable. Modified Model 93-M Marion 3-yard shovels are used for loading.

Supplementing electric rail and truck haulage systems, where adequate ventilation is available, are Diesel locomotives and Diesel trucks and shuttle cars.

Several manufacturers now offer Diesel powered, rubber tired trucks for underground use. These range in size from 6 to 15 tons. KW-Dart re-

cently sold 20 of the 6 ton units to Kermac Nuclear Corporation for use in New Mexico. These are powered with a 77-horsepower Diesel engine. Such manufacturers as Oretrac and Getman offer similar equipment.

Riverside Cement has applied some interesting equipment in its room and pillar system. Rooms are excavated 30 feet high by 60 feet wide by the length of mineralization. Three successive 30-foot cuts are made to establish the final room floor 90 feet below the roof. Ingersoll-Rand Company designed the largest 4-boom jumbo with remote control for this job. A Pitman Giraffe is used for scaling the roof to heights of 65 feet. This hydraulically operated, truck mounted crane is equipped with outriggers and may be controlled from the truck or from the working platform.

Ingersoll-Rand centrifugal air compressors with capacities of 20,000 cubic feet per minute were recently delivered to The Anaconda Company, in Butte. These units have three stages of intercoolings and will provide the characteristic low maintenance cost of this type of compressor, together with efficiencies comparable to reciprocating units. These compressors are very compact and are amenable to semi-automatic or automatic control.

MISCELLANEOUS EQUIPMENT: Rotary percussive drilling has proved effective in soft and medium types of ground, yielding high drilling speeds. Bits suitable for harder drilling conditions are in the development stage.

An interesting variation of the rotary-percussive method of drilling is being used with vertical rotary blast hole drills. In hard rock, down-the-hole drills with tungsten carbide bits of 7 inch diameter are providing higher penetration rates than roller bits. Both Gardner-Denver and Ingersoll-Rand companies have developed large down-the-hole machines capable of drilling 9 or 10 inch holes. These can be used on the largest air-rotary blast hole drill rigs. Tungsten carbide bits in this size have also been developed. Such a bit has approximately these drilling characteristics: frequency 2,000 to 2,500 blows per minute, 0 to 80 revolutions per minute, 50,000 inch pounds of torque, down pressure up to 50,000 pounds.

In small hole drilling, outstanding results have been had with Gardner-Denver carburized drill steel using detachable bits with tapered friction type connections. Single use tungsten carbide bits in 1½ and 1 inch sizes have been developed using a shallow insert designed to prevent a reverse taper on the bit gauge.

In some cases, the footage on these single use bits compares favorably with footage obtained from multi-use tungsten carbide bits with several resharpenings.

1959 Blue Ribbon EQUIPMENT AWARDS

Mining World's annual Blue Ribbon Equipment Awards are made for new or improved equipment. Several hundred entries were received for this contest from manufacturers all over the world. The International panel of judges shown below made their selections for the most outstanding equipment contributions to the advancement of minerals industries technology.



Blue Ribbon Judges Meet in San Francisco

Standing

M. F. Williams, Supervisor, Research Laboratory, Oliver Iron Mining Division, Duluth, Minnesota.
George O. Argall, Jr., Editor, *Mining World*.
W. R. VanSlyke, Range Metallurgist, Cleveland-Cliffs Iron Company, Taconite, Minnesota.
Norman Weiss, Milling Engineer, American Smelting and Refining Company, Salt Lake City, Utah.
Elmer A. Jones, Southeast Missouri Division Manager, St. Joseph Lead Company, Bonne Terre, Missouri.
C. Philip Jenney, Consulting Geologist, Oakville, Ontario, Canada.

Seated

Fayette Brown, Jr., Vice President, Snyder Mining Company, Pittsburgh, Pennsylvania.
E. R. Borchardt, Director, Mining Research, The Anaconda Company, Butte, Montana.
Stanley H. Dayton, Associate Editor, *Mining World*.

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Use the reader inquiry card following page 48 to obtain further information on award winning items.



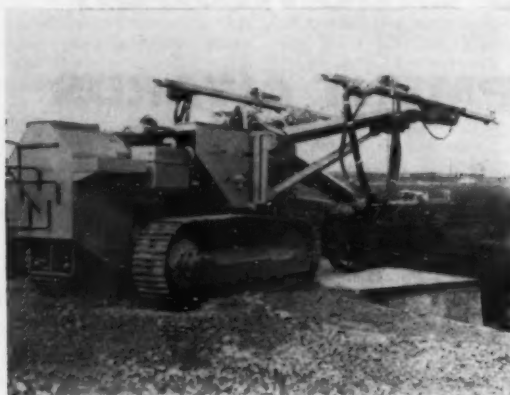
UNDERGROUND



DRILL PLATFORM is an elevator driven by air-motor along a rock-equipped guide rail which is bolted to a rock surface. It is used in driving raises. Maker is Alimak Verken AB. The unit contains connections for both air and water hoses. Circle No. 49.



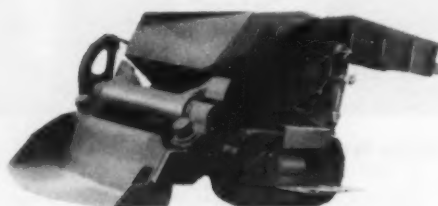
SINKING SKIP has special safety lugs that lock the crosshead and skip for movement in the shaft and prevent the skip from falling in the event of a cable failure. It has a 70-cubic-foot capacity. It was developed by Shaft & Development Machines, Inc. Circle No. 6.



THREE DRILL JUMBO was conceived by Gardner Denver Company to provide flexibility in stope and drift drilling and to cut labor requirements. Circle No. 1.



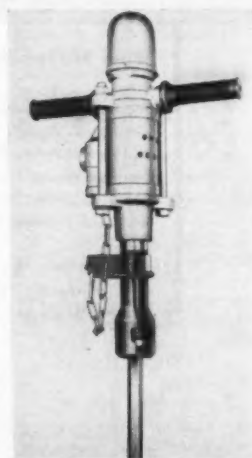
CHANNEL SCREW FEEDS were developed by Gardner Denver Company for use in mounting 4½ and 5½ inch percussion drills. These combinations have successfully drilled 8-inch burn cut holes. Circle No. 2.



EIMCO 635 is a new fast cycle mucker which features a steel flight conveyor and which handles 4 tons-per-minute. Circle No. 3.

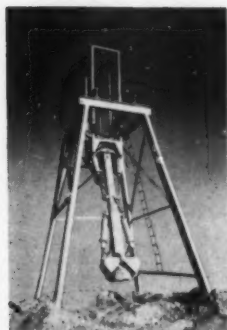


HYDRO DRILL JIB made by Jay Manufacturing Company now offers 180° boom roll so that holes can be positioned in places heretofore impossible to reach. Circle No. 8.

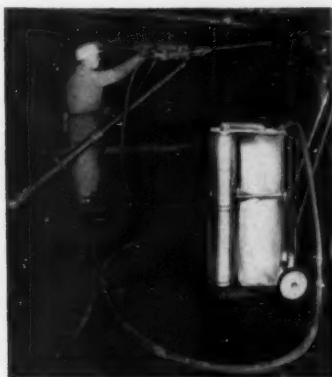


STEEL PULLER draws stuck steels without damage which otherwise would have to be blasted from the face. It operates similarly to a drill hammer, but with blows in opposite direction. Maker is Flottman Werke GmbH. It has been used successfully at several mines in Europe for troublesome problems. Circle No. 47.

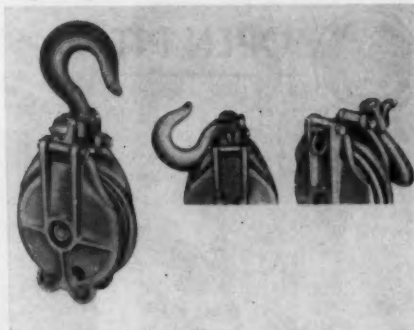
Blue Ribbon Equipment Awards



BETSY is an incline Cryderman for small diameter shafts. Maker is Shaft & Development Machines. Circle No. 5.



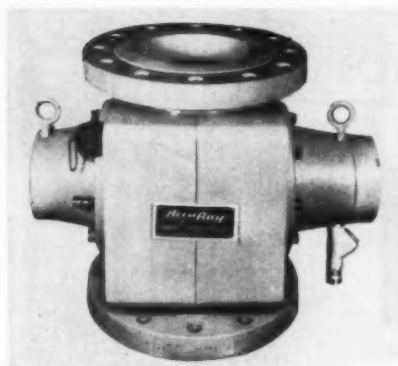
DUST EXTRACTOR for Thor Power Tool Company's new push feed drill is mobile and extracts cuttings by suction through drill and steel. Circle No. 43.



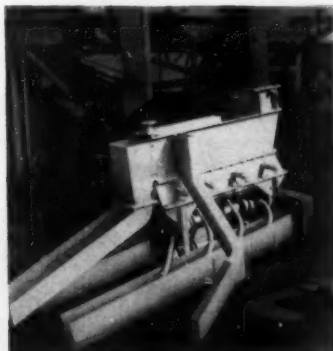
SHEAVE BLOCK made by Joy Manufacturing Company was designed to eliminate toggle pins, chains, nuts and cotter pins. It can be opened by simply revolving the hook 90° and pushing it aside. It was designed to save labor. Circle No. 4.



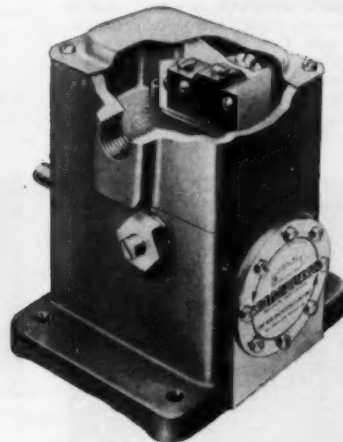
CONTROL and LABORATORY SERVICES



DENSITY CONTROLLER made by Industrial Nucleonics continuously measures and controls pulp flows. Circle No. 14.



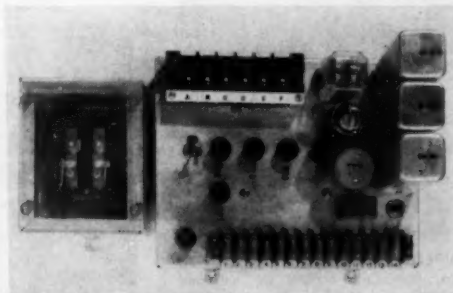
REMER JIG, in a pilot size model with some characteristics as larger models, has been designed by Western Machinery Company. The unit has a one foot by 3-foot 6-inch bed and has a capacity of one to five tons per hour. Circle No. 11.



ROTO-GUARD is a shaft motion indicator made by Bin-Dicator Co. It actuates warning signals. Circle No. 12.



MASS FLOW METER uses gamma radiation to measure pounds of solids per gallon and a magnetic flow meter to measure gallons; both signals are totaled to get pounds of dry solids. Maker is Ohmart Corp. Circle No. 10.



PROBE SWITCH SYSTEM was developed by Industrial Physics & Electronics Company for use in sensing the position of a product; it can be used for bin control, pump, and valve control. Circle No. 13.

Mining World's



OPEN PIT



TRACTIONAIDER, developed by Athey Products Corp., hydraulically transfers weight from the steering axle and trailing unit axle to the drive axle. It provides tractive effort in poor footing. Circle No. 25.



EXPLOSIVES BAG made by Bemis Bro. Bag Co., utilizes an extruded polyethylene liner and a multi-ply creped kraft paper outer tube. The new bag is said to be absolutely waterproof and shock resistant. It is used for AN mixtures. Circle No. 44.



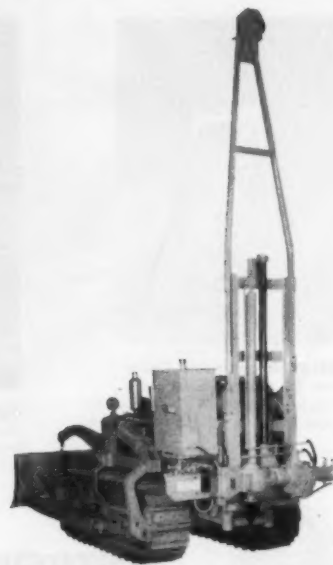
BLAST MASTER RIG made by Geo. E. Failing Company was designed to use both conventional rock or drag bits and the new down the hole tools. The rotary machine is mounted on a truck. Circle No. 28.



NEW H D8 TRACTORS are re-designed Caterpillar D8 machines that possess increased weight, horsepower, and productive ability over their predecessors. Circle No. 29.



NEW TRUCK built by LeTourneau-Westinghouse comes in three sizes, 27, 32 and 80 tons and features a Hydrair suspension system. Circle No. 30.



LIGHTWEIGHT DRILL developed by Mobile Drilling Company can be mounted on any 1/4 ton carrier. It was designed for boring to depths of 500 feet with diamond bits, augers and down hole tools. Circle No. 26.



DOWNHOLE DRILL was designed by Ingersoll Rand for hard rock. The drill weighs 460 pounds, uses a Carset bit weighing 126 pounds, and can put down 9-inch bore holes. Circle No. 27.

Blue Ribbon Equipment Awards



EXPLORATION



ROTARY DRILL is operated dry and extracts cuttings by vacuum. Made by James Vac-Lift Drilling Co., samples are delivered to a glass container continuously. Circle No. 40.



ELECTROMAGNETIC DETECTOR system of Aero Service Corp. is a high sensitivity, in-phase and out-of-phase system for low-level detail work. Circle No. 42.



MAGNETOMETER weighs only three pounds, can be used for reconnaissance from air or land. Made by Sharpe Instruments Ltd., it is a vertical intensity instrument. Circle No. 41.



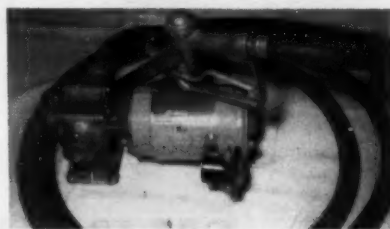
GENERAL EQUIPMENT and SUPPLIES



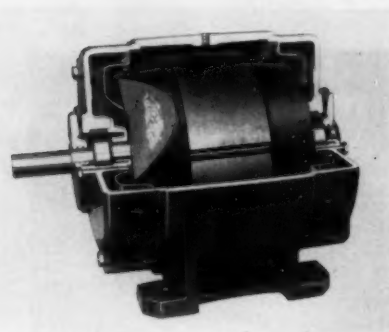
HERRINGBONE WIRE ROPE combines both Lang lay and Regular lay in one rope. Made by John A. Roebling's Sons Corp. it combines the advantages of each twist. Circle No. 33.



VIBRATOR developed by Cleveland Vibrator Company can be installed on air line alongside track; it slips on brackets welded to cars as they enter the dump point. Circle No. 35.

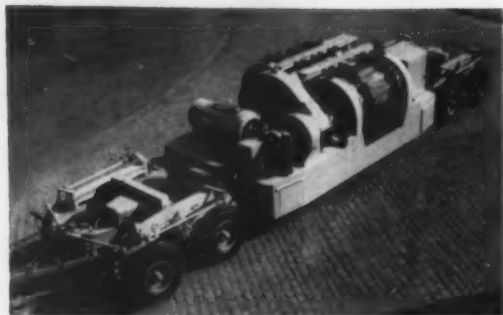


FUEL TRANSFER PUMP for servicing heavy equipment is powered by special D.C. motor. It is made by Transfer Pump Co. Circle No. 39.

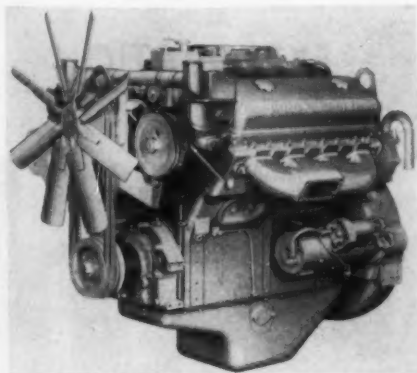


MOTORS with new super-seal of epoxy resin were tested by Allis Chalmers Mfg. Company in salt water. Both induction and synchronous motors are available. Circle No. 37.

Mining World's



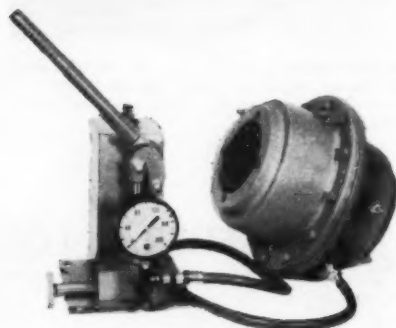
WHEELED FRICTION WINCH available from AG. Eisenhütte Prinz Rudolph in Germany, is said to permit exchanging of several ropes simultaneously in a third of the time normally required. Circle No. 48.



DIESEL ENGINES of new all-purpose line announced by Detroit Diesel Engine Division include two-cycle machines from 20 to 1,650-horsepower. Circle No. 36.



TRUCK CRANE made by Stanco Manufacturing and Sales, Inc. is fully hydraulic and can be operated by one man. The Hiab model 170 has safety features to prevent dropping of the load. The crane mounts in 15 inches of space behind the cab and takes no payload space. Circle No. 32.



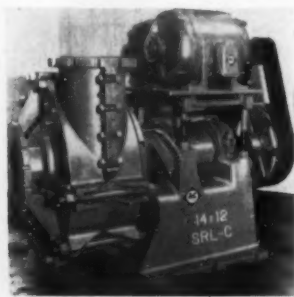
SLURRY VALVE controls the flow of slurries by means of air or hydraulic pressure. The Clarkson Company says that the pressure drop is the lowest of any valve, and that the unit has a jacketed steel housing. Circle No. 31.



ORE TREATMENT



SPARK SHIELD lowers to protect mechanical trolley punches when copper converter rotates out of the stock. It is designed by Western, Knapp Engineering Co. Circle No. 18.

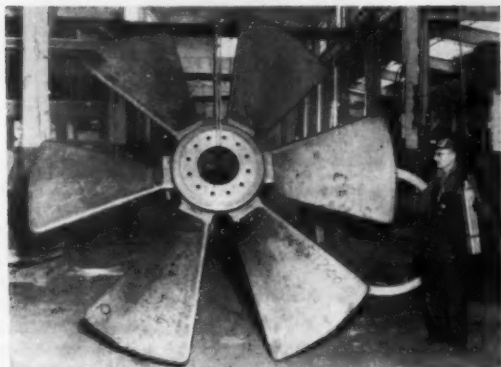


RUBBER LINED PUMPS made by Allis Chalmers Mfg. Co. have been extended in size to include new 12 by 14-inch units with 8,000 gpm capacities. Circle No. 15.



HYDRASTROKE FEEDER developed by National Iron Company is a hydraulically driven reciprocating unit designed to resist severe shock loads. Circle No. 20.

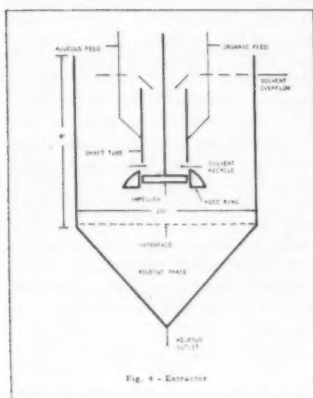
Blue Ribbon Equipment Awards



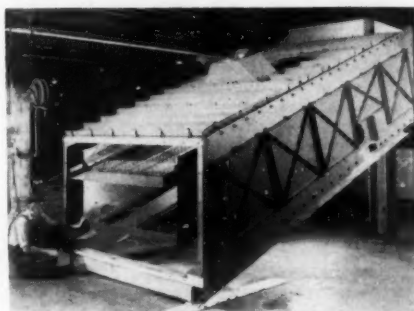
TURBINE TYPE PROPELLERS up to 120 inches in diameter can be used for agitation in tanks up to 50 feet in diameter. Made by Denver Equipment Company, the propellers are driven through a newly introduced line of worm gear reducers. Special features of propellers eliminate cavitation according to Deco. Circle No. 21.



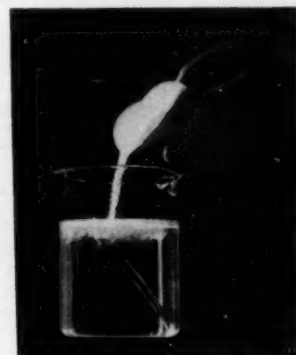
MARCY ROD MILL developed by Manufacturing Division of Mine & Smelter Supply can take rods 16 feet long. It is believed to be the largest rod mill ever made and it measures 12½ by 16 feet long. Circle No. 17.



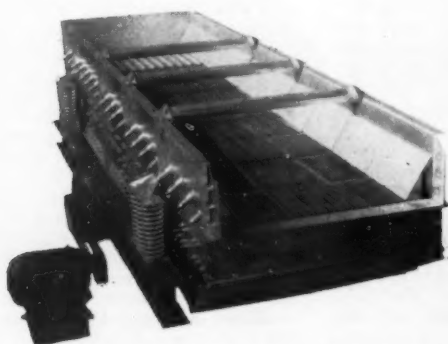
EXTRACTOR for liquid-liquid or liquid-solid solvent separation is made by General American Transportation Corp. Circle No. 19.



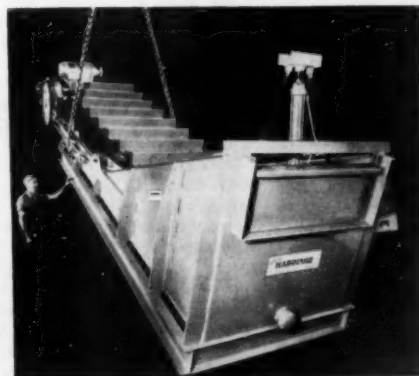
TOTALLY ENCLOSED SCREEN was designed by Allis Chalmers Manufacturing Co. for maintaining clean and healthful plants. The screen is equipped with air springs, quick opening latches, and can be provided with ex-hauser outlets at the top. Circle No. 23.



GUARTEC M is a new flocculant developed by General Mills Inc. which is said to offer extreme ease of dispersion in water. Circle No. 22.

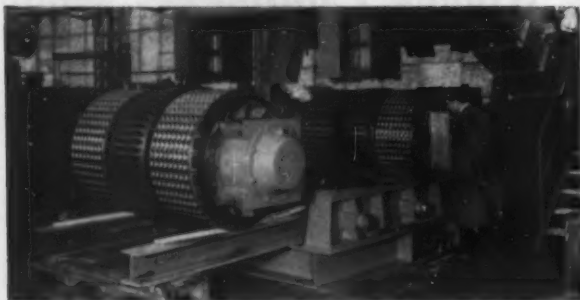


NEW SINTER SCREEN announced by Hewitt Robins is a vibrating unit designed to screen and move hot sinter as it comes off the line at mills; high temperature alloys and means for insulation are provided. Circle No. 24.

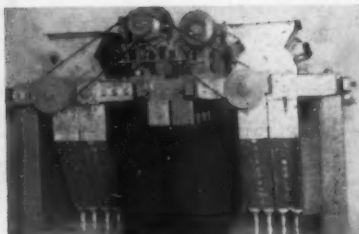


OVERDRAIN CLASSIFIER made by Hardinge Company has lifting flights attached to a belt; they move out of sand bed between two side shrouds, creating effect of a series of moving, washing compartments. Circle No. 16.

Blue Ribbon Equipment Awards



BRIQUETTING PRESS made by Klockner-Humboldt-Deutz contains rolls and roll drive shaft that are easily removed and refitted. Circle No. 45.



MAGNETIC SEPARATOR made by Lurgi is high intensity type for minerals of low magnetic susceptibility. Circle No. 46.

European Metallurgists Develop New HMS Vessel and Magnetic Separator

European metallurgical developments in 1958 centered on new processes and new equipment for treating fine material; particularly iron ore fines. As the steel plants increased output, it became necessary to produce a higher grade concentrate, by beneficiation, while maintaining recovery despite the difficulties due to the inclusion of finer sized fractions in the ore feed.

Although the heavy media separator has been widely used in the West German iron ore industry, a new separatory vessel with a special pulp-piping circuit has been developed which permits upgrading—with remarkable sharpness—of the 0.75 to 1.0 millimeter fraction. This represents a refinement of the box-type separator which had been proven in practical application. The separation heavy media of fine grained fractions is particularly important in Germany where limonitic ores predominate. This, of course, demanded a sharp separation between tailing and iron minerals, which, on a feed range between 3.0 and 1.0 millimeters, had a limited specific gravity difference.

Design characteristic of this new separator is the manner in which the pulp is handled to assure a quiet flow, free from turbulence from the feed end to the over flow. Because of the elongated design of the separator, the retention time of the feed is extended within the vessel in such a manner that even with small grained feed, having a small density differential between minerals, an optimum separating sharpness can be obtained.

Even operating with high densities with consequent mineral entrainment and resultant increase in pulp viscosity, operating results of this separator have been entirely satisfactory. The new separator has been proven in several West German iron ore concentration plants. Extensive tests on a number of other ores indicate that this new type of HMS separator will be

successful for concentration. In connection with this new separator, underwater screening of the feed should be followed. Incidentally, this underwater screen was reported in this European metallurgy section last year.

This underwater screening of the 1.0 millimeter, or even 0.75 millimeter fraction thoroughly deslimes it. This means that the media is not contaminated or its viscosity increased. Consequently, a clear sharp separation is possible.

With a lower screen size limit of 1 millimeter, or even 0.75, the optimum limit for heavy media separation has been reached according to present knowledge. Therefore, the efforts of the technicians were recently oriented toward the recovery of the iron lost in the slimes of hydrometallurgical concentrating processes.

Practical operating results have been obtained in West Germany by high intensity magnetic separation. High magnetic separators for the upgrading of weakly magnetic ores and minerals have been used for some time. The main purpose of the development of the separation process for limonitic iron ores under a 1 millimeter size was to obtain an increase in unit capacity which would represent a technical and economical solution. This is all the more important because the upgrading of very fine grain materials requires the drying of the pulp ahead of the magnetic separator.

The following process for drying and desliming fine fractions has been adopted: preliminary dewatering of slimes on filters or centrifuges, drying of the dewatered pulp in fluidizing dryers, and subsequent separation of the dried material and by high intensity magnetic separators.

The Goltz-Lurgi separator and the new Humboldt separator of Klöckner-Humboldt-Deutz AG should be mentioned. Both separators operate on the ejection principle. The latter has an operating width of 800 millimeters.

Its relatively high feeding capacity is due to the extremely intense magnetic field in the work-gap which is made possible by the special shape of the magnet poles. The magnetic poles are interchangeable. This has proved to be important because various types of ores very often have to be treated in the same plant. The problems of mechanical stability (ruggedness) and heating have been solved by the special design of the pulleys. These can be operated with a relatively high speed, compared with older types, which considerably changes the feed rate capacity. After numerous tests of the new Humboldt magnetic separator on limonitic and oolitic iron ores, feed capacity up to 10 tons per hour in the first stage and product yield of 5 tons per hour, including secondary cleaning, could be obtained with an optimum recovery and upgrading to a degree which had not been reached with any other separating process.

Tests made with highly disseminated hematite ores should be mentioned. The high intensity magnetic separation becomes of interest for the treatment of finely disseminated hematitic quartzites, and for the differential separation of the iron ores which contain fine fractions of magnetite and hematite.

These tests showed that it was possible to produce high grade hematite concentrate from highly disseminated ores through dry, high intensity separation. The dry method appears particularly interesting for those areas, or countries, where there is a shortage of water or where climatic conditions do not permit wet separation. Even for finely disseminated ores containing magnetite and hematite there is thus a possibility for a dry flowsheet.

In fine grinding it should be mentioned that a roll-crusher with offset rolls recently used for fine crushing in West German lead mills was entirely successful and proved to be of technical and economical importance. It could be assumed that this crusher will replace the throat-bearing-rolls or journal-bearing-roller types as soon as the practical results obtained with this off-set roll crushers become common knowledge.

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First Free Market U_3O_8 Sales Point To Need for Lower Milling Costs



By EDMUND C. BITZER
Consulting Metallurgical Engineer
Golden, Colorado

The year 1958 marked the beginning of a new phase in uranium milling with respect to the market and price for uranium oxide. The first private sale of oxide was made by one of the South African producers on a negotiated basis to a friendly country not represented by the Combined Development Agency. This country presumably had "shopped around" and found it advantageous to purchase South African material. The quantity involved in the transaction was probably not great but the significant aspect is that a competitive situation prevailed.

So far as the domestic market is concerned recent announcements by the United States Atomic Energy Commission relative to a leveling off in concentrate procurement came as something of a surprise to domestic producers; coupled with some degree of shock when it became apparent that the Commission was intent on negotiating prices, for delivery prior to April 1, 1962, that were less than the \$8.00 per pound price promised for the period between April 1, 1962 and December 31, 1966. The fact that lower prices have in fact been negotiated with a number of producers indicates that the uranium mining industry is facing an ultimate free market, albeit with some reluctance.

According to estimates from authoritative sources production of power from the fission of uranium is assured within a decade with a strong possibility of a "snow-balling" demand thereafter. A competitive situation with uranium oxide from foreign sources can, and probably will, develop in the near future. Therefore, a brief review of Free World uranium reserves, with some comparison of milling methods is of particular interest at this point

because the cost of milling will be one of the major factors in determining the price level of a free market. Current production in the Free World comes principally from the United States, Canada, and South Africa with a minor amount from other sources as detailed in Table No. 1. Both South Africa and Canada have large gold mining industries as well as large and comparatively low-grade uranium reserves which are generally uniform so far as ore characteristics are concerned. Domestic ore reserves are considerably richer in uranium content but they are far from being uniform in composition and characteristics. For this reason the domestic milling industry has confusing aspects and great diversification. It probably is not yet as well prepared, on the whole, to compete effectively in a free market as the larger integrated operations in South Africa and Canada.

Table No. 1 indicates the principal reason for the halt in the headlong rush to build more and more domestic milling capacity and the wisdom of the move is apparent in the long range view. The domestic reserve estimate is probably lower than actual; even so it is not a substantial base for nuclear power production. Also at the current production rate the reserve will last little more than a decade and under present conditions there is no incentive for exploration and development of fresh reserves. This constitutes a national problem of some importance unless the nuclear power program is advanced rapidly enough to encourage risk capital for exploration.

Aspects of Uranium Milling

Uranium is readily amenable to a variety of hydrometallurgical processes and most of the minerals, of which there is an extremely large number, are soluble in either acid or alkaline solutions. The degree of solubility is generally high under optimum conditions for the minerals involved and this rarely constitutes a problem for the metallurgist.

The succeeding step in the recovery process—that of reclaiming the uranium-pregnant solution from the leached residue of ore—presents prob-

lems of varying degrees and this step is the focal point of this review. As will be seen subsequently Canadian and South African ores are relatively easy to treat in this respect, whereas domestic ores as a general rule are not.

Following solution recovery it is now almost universal practice to concentrate and purify the primary pregnant solutions by means of ion exchange or solvent extraction prior to final precipitation of uranium salts. The exception of this is in alkaline leaching. Here again, foreign producers have adopted solvent extraction for this step which requires, and to date has been limited to, clarified solutions.

South African Plants

The uraniferous portions of the gold deposits in the Transvaal and Orange Free State will last for over 60 years at current production rates. However, since uranium production is largely tied to gold mining it is unlikely that this source could adjust to meet any sudden surge in demand on a free market at a substantially lower price. At current prices the South Africans could afford to make the investment to effect a substantial increase in production and for this reason the Combined Development Agency has recently imposed a ceiling on purchases of 6,200 tons annually.

From the metallurgical standpoint the milling is relatively simple and inexpensive. Sulfuric acid leaching is employed universally with a consumption in the range of 30 to 50 pounds per ton. With the exception of ion exchange and precipitation steps the uranium plant flow sheets and equipment parallel the cyanide operations and drum filters are used in the solution recovery steps. The capacity of the equipment is phenomenal and a single 14 by 16 foot filter has a capacity of from 700 to 900 tons daily of acid pulp.

All of the sulfuric acid consumed by the uranium plants is produced on a cooperative basis from certain of the mines who have sufficient pyrite in their ores for economical recovery and conversion to acid, and the cost of acid is consequently quite low as com-

TABLE NO. 1
Free World Uranium Reserves and Current Production

Country	Tons U_3O_8	Tons Ore, Million	Average Grade, pounds per ton	Annual Production, Tons U_3O_8
South Africa	37,000	1,000	0.74	6,000
Canada	380,000 ¹	320	2.37	15,000
United States	175,000	70	5.00	15,000
Other ²	—	—	—	4,000

1. Blind River area only. 2. Belgian Congo, Australia, Portugal, France (individual figures not available).

Uranium Metallurgy

pared to purchase in the open market.

The prices paid to South African producers by the CDA have never been disclosed but a perusal of published earnings statements of uranium producers for the first two quarters of 1958 indicates substantial profits from uranium recovery. There is little question but that most of the South African uranium mills could remain in production at much lower prices in a free market.

Canadian Plants

The Blind River area constitutes the bulk of Canadian reserves as presently known and since they will be the most potent factor in the immediate future market this review will be confined to the milling of these deposits. There are many points of similarity with the South African reserves in that they are large and relatively uniform in characteristics. There is no byproduct factor in the economics but the relatively high uranium content compensates for this. The material is amenable to acid leaching and all of the plants use this process. Again, like South Africa, Canada has an extensive gold mining industry and the design and equipment used in the Canadian plants is strongly influenced by their cyaniding experience.

At this juncture it should also be noted that all South African and Canadian plants are located adjacent to the ore supply. Consequently there is no transportation charge in the treat-

ment costs and since the ownership of ore and plant is integrated the capital and operating costs of sampling is avoided. These two factors give these producers an appreciable competitive advantage.

All the Canadian plants, with two exceptions have standardized on two-stage filtration as a means of solution recovery. Two of them use a five-stage CCD thickener recovery system. It is reported that, with the use of filter aids, filtration rates vary between 800 and 1,100 pounds per square foot of filter area per 24 hours. This means that a 14 by 16 foot drum filter would handle between 280 and 325 tons per day—somewhat below the rate experienced in the average cyanide plant. It is noteworthy that only two plants use a CCD system for solution recovery. This will be mentioned later in connection with design of domestic plants.

Acid consumption on the Blind River ores is reported as between 70 and 100 pounds per ton; somewhat higher than the requirement of the South African ores. No information is available on the source or relative cost of acid but since the ores contain between 2 and 6 percent sulfides the area is assured of an adequate and cheap source of acid for long range production.

Domestic Plants

Domestic ores are much higher in grade than those from other major production areas but are also quite

variable in composition and characteristics. They range from relatively slime-free sandstones with low acid consumption to highly bentonitic sedimentary materials with varying amounts of lime and other acid-consuming components. Some consist largely of calcareous material and for economic reasons are amenable only to alkaline leaching. Many of the sandstone ores are amenable to up-grading by wet methods and several such plants are noted in Table No. II.

Although several large districts have been developed in the past few years in New Mexico, Utah, and Wyoming domestic reserves may still be characterized as being scattered and of limited extent as compared to the foreign sources described above. All domestic mills are required to accept custom ore and some of the plants are not located to the best advantage with respect to ore haulage.

The above explains in part the reason for the wide variety of treatment schemes and competing processes in being in the domestic milling industry. Other contributing factors lie in the enormous amount of research and development on ore processing methods by the Atomic Energy Commission and the American talent for experimentation and improvisation.

Aside from the difference in average grade the distinguishing characteristic of domestic ores in the difficulty of marking an effective liquid-solid separation. This is not as easily or cheaply accomplished as on foreign ores and this fact has not always been fully appreciated—sometimes with unhappy results. Accordingly, the plants listed in Table No. II are classified with respect to this detail; that is, whether solution recovery in some form is employed or if a resin-in-pulp system is used.

Resin-in-Pulp (RIP) Process

One of the most outstanding accomplishments of the development program sponsored by the Atomic Energy Commission was the introduction of the RIP process which completely eliminates the problems of the solution recovery step. This furnished the impetus for the first major program of mill construction beginning in 1954 and five acid leaching plants using the process were constructed in quick succession. All of these are still in operation with excellent metallurgical results and all of them proved to have capacities far in excess of that designed into them. However, all of them had common difficulties due to the mechanical engineering of various features, principally in sand-slime separation and the construction of the baskets used in the ion exchange step. This tended to discourage the initial enthusiasm for the new process and a number of acid leaching plants were constructed subsequently with conventional methods of solution re-

TABLE NO. II
Uranium Mills in the United States With Leaching Methods
and Key To Uranium Recovery by RIP (Resin-In-Pulp),
SR (Solution Recovery), or X (Up-Grader).

State and Company	Acid Leach	Alkaline Leach	Up-Grader
New Mexico			
Anaconda Company	RIP	SR	—
Phillips Petroleum Company	—	SR	—
Kernac Nuclear Fuels (Grants)	SR	—	—
Homestake-New Mexico Partners	—	SR	—
Homestake Sabin Partners	—	SR	—
Kernac Nuclear Fuels (Shiprock)	SR	—	—
Arizona			
Vanadium Corp. of America	—	—	x
Rare Metals Corp. of America	RIP	—	—
Utah			
Uranium Reduction Co.	RIP	RIP (projected)	—
Monticello (AEC)	RIP (not operating)	RIP (experimental)	—
Texas-Zinc Minerals Co.	SR	—	—
Vitro Uranium Co.	SR	—	—
Union Carbide Nuclear Co.	—	—	x
Cog Minerals	—	—	x
Colorado			
Cotter Corporation	—	SR	—
Union Carbide Nuclear Co. (Uravan)	SR	—	—
Union Carbide Nuclear Co. (Slick Rock)	—	—	x
Union Carbide Nuclear Co. (Rifle)	SR	—	—
Trace Elements Co.	RIP	—	x
Climax Uranium Co.	SR	—	—
Vanadium Corp. of America	SR	—	—
Gunnison Mining Co.	SR	—	—
South Dakota			
Mines Development, Inc.	RIP	—	—
Washington			
Dawn Mining Co.	SR	—	—
Oregon			
Lakeview Mining Co.	SR	—	—
Wyoming			
Western Nuclear Corp.	RIP	—	x (projected)
Lucky Mc Uranium Corp.	SR	—	—
Fremont Minerals, Inc.	SR	—	—
Federal Uranium Corp.	RIP	—	—
Union Carbide Nuclear Co.	RIP	—	x

covery, partly to avoid the apparent shortcomings of RIP but to some extent to experiment with solvent extraction which so far has not been successfully adapted to a pulp system.

Virtually all the difficulties with RIP were overcome in the design of the first RIP plant in Wyoming by Western Nuclear Corporation. Like its predecessors this plant proved to be extremely flexible with respect to capacity and in addition to being trouble-free it is probably the lowest cost acid leaching plant built to date, per ton of capacity.

In the meantime another variation of RIP was tried at the Maybell, Colorado plant of Union Carbide Nuclear Corporation which replaced the conventional baskets with vessels that are adapted to continuous operation. Details of this operation and equipment are not available but two more acid leaching plants of similar design are projected for the Gas Hills area in Wyoming. In addition to these, Uranium Reduction Company at Moab Utah will convert a section of its RIP plant to treat pulps from alkaline leaching of high lime ores.

One of the characteristics of the process, that is difficult to equal by any other system, is the low dissolved loss in the sand-slime separation which corresponds to the solution recovery step in conventional systems of filtering or thickening. With four stages of CCD washing in classifiers the quantity of dissolved uranium in the sand reject cannot be assayed by conventional control methods; whereas in a conventional solution recovery system recovery of 98 percent of the dissolved values is considered to be acceptable performance. On the basis of a head value of 0.25 percent U_3O_8 , an extraction of 93 percent and a product value of \$8.00 per pound, a 2 percent soluble loss amounts to \$0.74 per ton treated.

It appears that the RIP process has now come full circle and the performance is beginning to vindicate some of the earlier judgements concerning its possibilities. Inasmuch as future milling capacity to take care of the demands of nuclear power must of necessity be amortized by private industry the process still appears to be assured of a bright future.

Domestic Recovery Processes

A. Acid Leaching—Three general variations of solution recovery are used by domestic acid leaching plants: CCD with thickeners followed by filtration of the final thickener underflow, and a combination of thickeners and classifiers with CCD wash in series through both machines.

Of the three variations the first is probably the least desirable particularly since most of the plants in this category depend upon only four thickeners. Ordinarily this is not enough to get a satisfactory recovery



AMBROSIA LAKE'S first uranium mill went into operation in 1958. The mill is operated by Homestake-New Mexico Partners.

of dissolved value unless an extremely high wash ratio is used. It was noted previously that of the two Canadian plants that depend upon straight thickening five stages are employed. In point of fact, CCD washing with thickeners never gained much favor in gold milling and its general adoption in uranium milling is surprising.

The combination of CCD thickeners with final filtration is conventional cyanide practice and should give acceptable results although in most instances there would be room for improvement. Many cyanide plants find it profitable to extend the final filtration to two stages. The problem of using thickeners on most domestic ores is complicated by the fact that fine grinding is not necessary for good leach extraction and thickeners are not well adapted to handling coarse grinds. This has led to the combination of classifiers and thickeners in which the coarse fraction is segregated and washed in the classifier circuit. Since the average underflow density of this system is higher than for thickeners alone good recoveries are possible.

B. Carbonate Leaching—Carbonate leaching has recently found favor in New Mexico for the treatment of Ambrosia Lake ores as evidenced by the recent construction of three mills using the process. Solution recovery methods here are limited to filtration due to two limitations of alkaline leaching. One is that the mill solutions are re-cycled after precipitation. This is a cost advantage so far as reagent consumption is concerned and perhaps the true limitation is that a truly barren solution cannot be produced for washing on the filters. Since the water make up requirement for the process is small, two and three-stage filtration is required to keep soluble uranium losses within bounds. Of the three

plants concerned, all of which have only recently gone into operation, two employ three stage filtration and one is operating with two-stage recovery.

It is of interest to note that a fourth plant, also recently completed in the same area, elected to use acid leaching. The ores in the area have a lime content of from 2.5 to 6.0 percent—not enough to rule out acid leaching and if comparative cost data ever become available (adjusted for differences in recovery) the comparison would be of vital interest.

Up-Grading

Many of the sandstone type ores on the Colorado Plateau and elsewhere are amenable to up-grading by wet gravity methods and it is interesting to note that four plants are in operation and two more are projected. Where up-grading is possible the economics are very attractive and with the approach of a free market more operations of this sort are to be anticipated.

Conclusion

It is not possible to make cost comparisons between various processes and operating methods at the current stage of the industry, but virtually all combinations are under experimentation. Obviously some must inevitably fall by the wayside. If nothing else, the planning and design of domestic uranium mills has been characterized by individualism and strong opinions concerning the merits of alternate milling methods. Much of this has been made possible by the arbitrary price fixing for concentrate, and only in the atmosphere of competition will some of these matters be settled. Technology, like many other things, is improved by the rigorous climate of the market place.

Modern Ore Finding Techniques Improve With Discoveries In Many Countries



By **THOMAS E. GILLINGHAM**
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Oxford, Pennsylvania

The production of most minerals reached a low point in the early months of 1958. Despite the substantial upturn later, the year as a whole was not a happy one for many segments of the mining industry, including exploration. Domestic copper mine output declined 10 percent, lead and zinc 23 percent, iron ore 36 percent, and titanium sponge 75 percent. Chromite and tungsten ore production fell off almost to the vanishing point; even gold and silver output decreased to the lowest level in over a decade. Aluminum producers were in trouble, more by reason of a sudden 14 percent increase in production capacity than by fall in demand. On the other hand, mercury and uranium producers, bolstered by government purchases, had a good year. Cement, gypsum, and phosphate rock were particularly bright spots in the non-metallic field, each showing substantial gains over 1957.

The decrease in the exploration effort was proportionately greater than the decline in net profits, for funds normally available for research and exploration budgets, if they existed at all, were largely diverted to dividends or to contractual obligations of one type or another. As John Ridge pointed out in the April 1958 issue of *Geotimes*, the vulnerability of exploration plans and personnel, to even a light depression, became more than ever evident. While a few of the larger companies retained their staffs intact, there were numerous layoffs and almost no hiring, except for foreign jobs. The plight of the college graduate seeking a career in exploration was especially difficult.

The growing nationalism in Africa, India, and South America has already affected the exploration and development of mineral resources in those areas. Russia is trying desperately to

gain footholds in the under-developed countries, and in helping to counteract those efforts the geological surveys of the British Commonwealth, France, and the United States are doing a commendable job. America's "ambassador" in this work is Dr. W. D. Johnston, Jr. of the United States Geological Survey, who in recent years has surpassed even Secretary Dulles in international travel mileage. Johnston, working through the I.C.A., has trained in this country 243 geologists from 44 foreign countries and has supervised carefully selected U.S.G.S. cooperative parties in almost as many countries. The good-will engendered and the information obtained by these men, as well as by similar groups from the U. S. Bureau of Mines, are beyond measure.

THE FEDERAL GOVERNMENT ACTED on several other matters concerning the mining industry. The AEC nullified in effect almost all incentive to uranium exploration by shutting off from a presently guaranteed market all uranium ore reserves not already developed by November 24, 1958. The purpose of the move was "to hold uranium production in reasonable balance with requirements," and the announcement states that the purchase program may be expanded if the need arises. Obviously, no one can predict the future requirements for uranium. If the more sanguine forecasts for atomic power come true, there may be a Free World need for 50,000 tons of U_3O_8 per year by 1975. The nation's uranium ore reserves last December were 81,900,000 tons, containing about 320,000 tons of U_3O_8 .

The Government terminated its stockpiling program for most mineral commodities, including chromite, mercury, and fluorspar, on December 31, 1958, but there was by that date considerable pressure on Congress to extend the program in order to save the industries affected. After seven years of activity in the encouragement and assistance to private mineral exploration, the Defense Mineral Exploration Administration program was terminated on June 30, but it was resumed on September 2 with slight modifications as the Office of Minerals Exploration program. The DMEA work had resulted in the finding of \$23 worth of potential ore for every dollar spent.

By still another enactment, Public Law 867, the 85th Congress recognized "geological, geochemical and geophysical surveys conducted by qualified experts" as valid labor performance for assessment work on Federal mining claims. This law opens the way to the search for hidden ore bodies by giving the searcher adequate legal protection.

In 1958, contract drilling for metallic ores and the sales of diamond drilling equipment fell off markedly,

fewer claims were recorded in the United States and Canada, and only one or two minor rushes took place. It is not surprising, therefore, that notable discoveries, in North America at least, were fewer than in previous years. Many of the news items, from which the present review is largely gleaned, were either the announcements of the results of earlier exploration or progress reports of developments.

Apparently, the long-range, international exploration programs fostered by some of the larger companies with adequate financial reserves fared somewhat better last year than smaller domestic and Canadian programs. Yet there was an evident reluctance on the part of mining companies to accede to high option demands of landowners both here and abroad. Numerous options and some concessions were relinquished, either because the optionees found their commitments too burdensome for the times or because exploration results were less than hoped for.

American Smelting and Refining Company relinquished its option to the Bethlehem Copper Corporation's property in Highland Valley, British Columbia, and Phelps Dodge Corporation gave up its option to the Jericho Mines property in the same area. Bear Creek Mining Company withdrew its application for a copper mining lease in Michigan's Porcupine Mountains State Park because of conservationist opposition. Bear Creek also terminated its phosphate exploration in Beaufort County North Carolina, and reduced its large drilling program for copper at Safford, Arizona. Aluminum Company of America's subsidiary, Piedmont Properties, announced that its drilling program for alumina ore near Spartansburg, South Carolina, had been unsuccessful.

ON THE POSITIVE SIDE, happily, there is far more to report. Considering first the old mining camps of the world, it is apparent that persistent exploration of known areas of mineralization yields important results. It can even be said that the day of the prospector-miner, who has the faith to drive ahead on meager showings in such areas, is not yet over.

From the Coeur d'Alenes of Idaho, Roger McConnel reports that on the 13 level of the Bunker Hill mine a newly discovered lead-silver vein, after 600 feet of development, is still open at both ends. New ore has been opened up in the Crescent, Sunshine, Galena, and old Black Bear mines farther east, and Lucky Friday Silver-Lead Mines Company recently acquired by Hecla Mining Company has developed a 20 year reserve of ore averaging 8.8 percent lead, 1.4 percent zinc, and 18 ounces silver per ton. At Cripple Creek, Colorado, 500 feet of gold ore was discovered in the old Ajax mine, but deep development in the Cresson mine proved disappointing. Bear Creek Mining Company's work on the 1050 level off the Burgin shaft in the East Tintic district, Utah,

has disclosed an extensive zone of oxidized, low-grade lead-zinc-manganese material and deeper drilling from the level has cut higher grade lead-zinc-silver sulphides with manganese carbonate. At Kennecott Copper Corporation's Ray mine in Arizona, careful geological work and drilling have disclosed large additional tonnages of copper ore, and just south of the border, at Cananea, Anaconda Company found important disseminated ore beneath the Colorado pipe. In the Mineral Hill district, Arizona, Asarco has picked up the extension of the East Pima ore body by recent drilling on the adjoining Xavier property.

St. Joseph Lead Company has found important lead ore bodies in Southeast Missouri; American Zinc Company of Tennessee, with DEMA help, blocked out by drilling 35,000,000 tons of zinc ore near its New Market, Tennessee, mines (see MINING WORLD, June 1958), and Putman Exploration Company, also with DEMA help, extended the Treadway zinc district of East Tennessee much farther south, from Hawkins County into Grainger County. In the newer uranium camps of the West, in spite of the lack of much incentive, additional tonnages of ore were found. Standard Uranium Corporation reported the discovery of 600,000 tons, worth \$20,000,000, at its Big Indian property in Utah. Rumors were confirmed of a new discovery by Anaconda a few miles west of its Jackpile mine in New Mexico.

In Canada, the deepest work in the Americas is progressing favorably at Wright Hargreaves Mines Ltd.'s mine, where a good shoot of 0.7 ounce gold ore across 5.5 feet has been found to persist at least to the 8,100 foot level. Generally good exploratory results are reported from the gold mines of the Red Lake and Porcupine camps of Ontario, and with the merger of Bralorne Mines Limited and Pioneer Gold Mines of B.C. Ltd. in British Columbia, interesting news can be expected from that quarter.

Substantial additions to the reserves of the old Mosambi copper mine in India are reported as the mine workings approach a depth of 3,000 feet. And speaking of depth, the H-wince at the East Rand Proprietary Mines Ltd. at Boksburg, Transvaal last summer reached a point 11,003 feet vertically beneath the surface and over 3.5 miles down the dip. Each 1,000 feet on the reef dip at this mine brings into ore reserves about 10,000,000 tons of ore and 2,500,000 ounces of gold.

One could relate for many pages the successes reported in old mining camps the world over. Certainly, much of the ore for the future lies in the old camps, awaiting the application of geology or the pick of the prospector-miner.

RECENT ACHIEVEMENTS IN IRON ORE EXPLORATION and development have been most impressive. Infant iron and steel industries are springing up, or are being planned, in

many of the so-called under-developed countries, and the search for raw materials for these new comers, as well as for the behemoths of the industrialized world, proceeds at a quickening pace.

In North America, the great iron ore deposits around Lake Superior and in the Quebec-Labrador area yielded to further exploration and development, directed largely to the huge tonnages of low grade materials suitable for beneficiation. With the growing demands for iron ore in the West, from both the domestic industry and the Japanese, the search for minable deposits there has increased. The Southern Pacific Land Company announced the discovery of at least 60,000,000 tons of 30 percent ore in Pershing County, Nevada; Minerals Engineering explored a deposit said to contain 200,000,000 tons near Dillon, Montana; Columbia-Geneva Steel continued work on its Atlantic City, Wyoming, deposit, and Humble Oil Company, while searching for oil in the Dillingham area of Alaska, discovered a sizable body of iron ore.

Caribbean Iron Mines prepared to mine a 20,000,000 ton high-grade ore body in Trinidad, and from Antofagasta province, Chile, came word of the discovery of a 1,000,000,000 tons of high-grade iron ore at El Laco, which has been optioned by the Isbrandtsen Company. The Acari de-

posit in southern Peru, estimated at perhaps 100,000,000 tons of 65 percent iron, is being developed by American and Peruvian interests. But the most intriguing item from Latin America was the reserve figure on the Quadrilatero Ferrifero of Minas Gerais, Brazil, estimated by the Brazilian DNPM and the United States Geological Survey teams working cooperatively. The indicated and inferred reserves of hematite (plus 66-percent iron) above a 100 meter depth are 1,884,900,000 metric tons; the additional reserves of concentratable low-grade (itabirite) above a 50 meter depth are 23,493,500,000 metric tons, and the material almost certainly persists downwards! The M. A. Hanna Company, in taking over the St. John d'el Rey Mining Company's property, obtained a share of these reserves.

Russia claims to have outlined in the Kursk-Belgorod area, 350 miles south of Moscow, enough iron ore to keep the world's iron and steel production at its present rate for two centuries! In Burma, four deposits of iron ore, totaling 58,000,000 tons, were indicated by a survey made by the German firm of Demag. Near Muar, in the Malayan state of Johore, a 200,000,000 ton deposit of 63 percent iron is being developed by Kepong Mines, while another deposit of 17,000,000 tons of high-grade ore is developing in the state of Pahang



CANADIAN EXPLORATION continued on high level during the year with Craigmont Mines Limited outlining an important copper-iron ore body by geochemistry and magnetometry.

in eastern Malaya. About 100,000,000 tons of iron ore, estimated to lie in the Chitral region of Pakistan, will be the base of a new iron industry at Multan.

Intensive exploratory work in Tasmania has disclosed 100,000,000 tons of low-grade iron ore near Savage River, and other low-grade deposits have been found at Roper Bay in the Northern Territory of Australia and in the Constance Range, Queensland.

The iron ore resources of Africa are gaining in importance as new deposits are discovered and brought into production in Liberia, Sierra Leone, the French Cameroons, Southern Rhodesia, and Swaziland. Lamco's deposit in the Nimba Range of Liberia contains at least 200,000,000 tons of 60 to 70 percent iron, and recent work in the Bassa Hills and in the Webbo district farther east has disclosed other potentially large ore bodies. In the French Cameroons, exploration in the Kribi region has indicated 120,000,000 tons of high- and medium-grade ore, only 15 kilometers from the ocean.

Messina Development has found 80,000,000 tons of good hematite ore at Bukwe, Southern Rhodesia, and a 32,000,000 ton deposit of high-grade iron ore is reported from Bomvu Ridge, near Mbabane, Swaziland.

MANGANESE ORES are being sought in French Guiana and in Australia by Union Carbide Corporation, in Mexico by M. A. Hanna Co., in Greece by Belgian interests, and in Costa Rica. A large deposit, said to contain 68 percent manganese oxide, was discovered in 1958 at Alto Jari, Para, Brazil; a deposit in the Sinai Peninsula has been prospected by Egyptian geologists. U.S. Steel Company is exploring manganese deposits in French Equatorial Africa.

WITH THE DISCOVERY OF BAUXITE DEPOSITS in the lower Belgian Congo and adjacent French territory, equatorial Africa promises to become an important aluminum center, employing hydroelectric power to be generated by the great rivers of the region. Reynolds Metal Company reported the discovery of a large deposit of bauxite on Croker Island, off the coast of the Northern Territory of Australia. The Russians claim to have found an important bauxite bed at a depth of 60 to 70 meters in the Dniepropetrovsk area of the Ukraine.

COPPER DEPOSITS were sought far and wide on a somewhat reduced scale during 1958. A center of activity was the United States Southwest, where all the major domestic copper companies carried on a diligent quest for porphyry-type deposits, but no new major finds were reported. In Canada, there was considerable activity in the Highland Valley area, despite the exodus of Asarco and Phelps Dodge. At the Craigmont Mines Ltd.'s property, at the south end of Highland Valley, 13,000,000 tons of 1.86 percent copper ore had been outlined by the end of the year. In north-

eastern British Columbia, 125 miles west of Fort Nelson, Magnum Copper's drilling program has disclosed 500,000 tons of 6.61 percent copper ore in a series of veins. Another staking rush and stock market flurry followed the announcement in early July of the discovery of 4.0 percent copper ore in drill holes at the New Hosco Mines Ltd.'s property at Mattagami, Quebec. Additional work at Mattagami Syndicate's Watson Lake property at Mattagami, the discovery of which was of major interest in 1957, confirmed the original estimates of ore tenor and increased the total reserves to about 19,000,000 tons.

A Canadian company, Consolidated Halliwell Ltd., exploring in the Terre Neuve district of Haiti, found 5,200,000 tons of copper ore, said to average about 1.7 percent metal. Cerro de Pasco has outlined 96,000,000 tons of 1.6 percent copper ore in the Rio Blanco deposit, 32 miles northeast of Santiago, Chile, and at the Sanyati property in Southern Rhodesia the Messina (Transvaal) Development found 15,000,000 tons carrying 1.4 percent copper, 1.35 percent lead, and 2.85 percent zinc.

There were no very notable lead or zinc discoveries reported in 1958. From Pakistan came word that lead deposits in the Ushu Valley are being prepared for mining, but details are not available. The Outokumpu Company blocked out over 700,000 tons of lead ore at Korsnas, Finland, and the Egyptians claim to have found lead and zinc at Om Gheig.

The Wah Chang Company has developed several million tons of pyrochlore, carrying 3.0 percent columbium oxide, at the Araxa deposit near Bela Horizonte, western Minas Gerais, Brazil, and the du Pont company has optioned a sizable columbite deposit in Gunnison County, Colorado. Du Pont has also found a large ilmenite sand deposit in Tennessee.

OF THE NON-METALLIC DISCOVERIES OF THE YEAR, Delphi-Taylor Oil Company's potash find in southern Utah and Fiberboard Paper Company's announcement of a 750,000,000 ton gypsum deposit in Clark County, Nevada, are especially noteworthy. A large, high-purity silica sand deposit was opened near New Concord, Kentucky, by Murray Sand Company, and tiny diamonds were allegedly found in a well at Jersenville, Illinois in soapstone strata 155 feet below the surface.

A rich deposit of nitrate was reported found in the Balsas district, northern Peru, and a large, mineable deposit of good kaolin was discovered in the Bittersfontein area, 300 miles north of Cape Town, Union of South Africa. Two important emerald deposits were found in Southern Rhodesia, the first near Belingwe, where a mine is being established, the second in the Insiza River district, near Filabusi.

MODERN ORE FINDING TECHNIQUES are showing steady improvement. One can detect, however, a swing from the mere routine coverage of huge areas by various airborne equipment to a more discriminating approach involving more photogeological interpretation and the study of regional "lineaments," rock types, and local structures. This is a healthy development, for it places the geophysical methods in proper relation to the fundamental geological controls; it will help to solve the problems presented by the fact that while nine out of 10 of the geophysical anomalies found in ore search are sulphide bearing, only one in 99 is an economic mineral deposit. The screening of worthless sulphides from ore is still a paramount problem of exploration.

For geophysical work, both airborne and ground electromagnetic (EM) surveys have been given greater simplicity, accuracy, and penetrating power by the application of the natural field ground system, in which the transmitter is replaced by the earth's magnetic field. American Metal Climax, Inc. has made the system available commercially under the name AFMAG. Another development in EM work is Hunting's horizontal loop system, replacing the larger forms of the vertical loop. Mineralized vertical loops have also been developed. For airborne magnetometer work, Elliotts of England have brought out an electron deflection magnetometer with a theoretical accuracy of plus- or minus-10-gammas, and mention can be made once again of the Varian Associates' new nuclear precession magnetometer adapted to ground surveys. Geophysical Specialties Company has produced a new one-channel refractive seismograph which can be operated with ease and speed by two men and is especially applicable to finding depth to bed rock.

For low level prospecting over any terrain, the helicopter-borne EM method, such as the Newmont-Aero Service system, further proved its effectiveness. McPhar Geophysics, Ltd. of Don Mills, Ontario, has issued an excellent paper on the induced polarization (IP) method of geophysical prospecting.

Beryllium ores can now be detected by an instrument that records emanations induced in the beryl from a radioactive source.

GEOCHEMICAL PROSPECTING received no special impetus during 1958, but analytical methods were improved by the use of the fluorescent X-Ray spectrograph and the polarograph and by refined chemical procedures. In the *Mining Magazine* during the year, Hosking reviewed the flame tests for mineral identification, and Bowie and Taylor described a system of identifying ore minerals by accurate measurements of reflectivity and micro-indentation hardness. Ren-

shaw and Price described in *MINING WORLD* in July 1958, the application of geochemical prospecting methods at Craigmont.

In its broader aspects, geochemical research continued to show slow but steady progress. More absolute-age data came forth from the laboratories and a considerable amount of research was performed on water-silica systems and on various sulphide systems. The age of the host rocks of the Witwatersrand was shown to be at least twice as old as formerly thought and, according to C. F. Davidson (*Mining Magazine*, October 1958), the uraninite in the Rand deposits has been dated as roughly of the period of formation of the post-Transvaal Bushveld granites. Davidson has used this interpretation to support the hypothesis that the Rand ores are epigenetic rather than of placer origin.

There is still no inclination on the part of the mining industry to support the program of research into the distribution and occurrence of mineral deposits, which was recommended in 1956 by a committee of the National Science Foundation. Dr. James Boyd, chairman of the committee, said recently that in spite of industry's present lack of interest, there is still hope of eventual support, and that, meanwhile, the committee's report is serving the useful purpose of guiding research into recommended channels. It is high time for the mining industry

to give this program its all-out support.

In the scientific press of 1958, several excellent papers appeared for the benefit of the exploration geologist and others interested in ore deposits. The American Geological Institute announced in 1958 its intention to publish a new abstract journal, *Geoscience Abstracts*, beginning in January 1959. It will include abstracts of Russian, as well as North American, papers on all phases of geology. An excellent bibliography of ore deposits appeared last year as *GSA Memoir 75*, by John D. Ridge, and a bibliography of nickel was published as *USGS Bulletin 1019k*. A weighty volume of 843 pages on uranium deposits all over the world appeared as Volume 2 of the *Proceedings of the Second United Nations International Conference on the Peaceful Uses of Atomic Energy* (Obtainable from U.N. \$18.50).

The application of geology to ore finding at the Abbott Mine was described in *Mining World* in November 1958.

Among the descriptions of ore deposits published last year are the U.S.G.S. Professional Papers on the Jerome, Arizona, copper district, the Dover, New Jersey, magnetite district, and the Southern Elkhorn Mountains, Montana; U.S.G.S. Bulletins on the manganese deposits of Cuba, the barite deposits of the United States, the geology and resources of the continental shelves of the Americas, and

several on radioactive deposits. In *Mining Engineering* appeared Sanchez-Mejorada's paper on northeastern Mexico deposits, 'Terrones' on the Peruvian Cordilleran deposits, Lovitt and Skerl's on the Lovitt Gold Mine, Webster's on Magma Copper, and Folwell's on Lucky Friday. *Economic Geology* contained descriptive papers on Mt. Lyell Mines, on Yugoslavian iron deposits, on the pyrite deposits of Minas Carlota, Cuba, on Santa Barbara, Mexico, on western fluorite deposits, and on the North Carolina phosphate occurrence, as well as a number of excellent papers on special subjects. Other noteworthy papers were Mayo's on the lineament tectonics and ore deposits of the Southwest, Stringham's on the relationship of ore to porphyry in the West, Heinrich's on the geology of the rare earth elements, Klar's on the graphite deposits of the world, and Ingerson's on Russian geologists (Geotimes).

In summary, the lowered rate of new discoveries, at least in North America, reflected the slackening of the exploration pace. There was much to report of developments in foreign lands, although discoveries in remote regions are often difficult to date and to verify. If forecasts of the future demands for mineral products are to be taken seriously, it is evident that the exploration effort must be expanded and maintained as the most vital facet of the mineral industry.

Flotation and Magnetic Concentration Draw Metallurgists Attention in 1958



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The emphasis in 1958 was more on reducing costs or improving efficiency of existing processes than on new developments. This trend can be attributed

to the depressed prices and the low production of metals, starting in late 1957. As a result, although the number of articles published on ore-dressing developments during 1958 were as great as ever, few outstanding developments were reported.

CRUSHING AND GRINDING: Appareils Dragon, S.A., of Fontaine, France, claim the distinction of manufacturing the world's largest jaw crusher. The crusher has an effective opening of 8 feet 3 inches by 5 feet 3 inches. It is used to crush stone blocks weighing up to 10 tons. It has a capacity of 600 to 800 tons per hour of run-of-quarry stone.

A new method of impact shattering was reported by T. Nagel. The solids to be impacted are carried in streams of air or steam. Two opposing streams are impacted at sonic velocity. The inventor claims that the operating cost of impact shattering will be approximately one-half that of current compartment mill grinding.

Autogenous grinding has been of continuing interest. The successful operation of the 22-foot Aerofall installation by Messina (Transvaal)

Development Co., Ltd. in Africa is typical of the progress in this type of comminution. Feed to the Messina mill is the mined ore as delivered by the mine skip. The product, which is 65 percent minus-200-mesh, goes directly to flotation.

Two types of vibrating ball mills were introduced. After several years of development work, Allis Chalmers Manufacturing Company released a 15-by-15-inch, 15-horsepower horizontal mill for dry-grinding applications. The capacity is rated at up to 1 ton per hour of product having a finely controlled particle size. This machine is claimed to provide up to 30 times more capacity per cubic foot of grinding volume than a conventional ball mill; the capacity of the 15-inch circuit is comparable to a 4-by-8-foot conventional rotating ball mill. A line of vibrating ball mills is contemplated for wet and dry applications and for grinding-energy expenditures of up to 200 horsepower. British manufacturer, Wilbain Boulton Limited, brought out a vertical vibrating mill called the Vibro Energ mill in 2½-by-2½-foot and 5-by-5-foot sizes. Boulton says that the new mill has a capacity of six times that of a ball mill the same size. The advantages claimed are: accurate control of particle size, low power, small floor space, and long ball life.

E. C. Bond, Alfa Chalmers, defined the problem of the proper size of balls in a grinding mill. He pointed out that the size of balls should be determined by the nature of the material to be ground, the desired fineness of the product, and the type of mill. He also pointed out that the size of balls should be determined by the nature of the material to be ground, the desired fineness of the product, and the type of mill.

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Technology, described the results of his continuing study of fine grinding at supercritical speeds. A laboratory-size mill was operated under idealized conditions. The principal variables were tumbling charge, friction, and mill speed. On the basis of the results obtained, it is proposed that mills provided with smooth lining, grinding should be possible over a wide supercritical speed range.

F. J. Windisch and E. J. Duggan of American Metal Climax, Inc., reported results of several long-term tests in operating mills. Quantity of ore ground with such balls was more than with hard balls, based on equivalent size and power consumption. A comparison between 3-inch forged carbon steel balls with a Brinell hardness of 355 and forged high alloy steel balls with a Brinell hardness of 575 showed an advantage of about 8 percent in ore ground per hour for the softer balls. The difference in rate of grinding is attributed to the comparatively rough surface developed on the softer balls, which probably has a greater abrasive effect than the smoother surface. The softer balls, it is noted, wear at a faster rate. The consumption of balls per ton of ore ground was 1.5 times for soft balls.

A millwright's view, including various types of grinding balls, is presented by William H. Martin, American Cyanamid Co. He points out that the use of grinding balls with high hardness is possible in determining the rate of grinding. He also points out that the use of grinding balls with high hardness is possible in determining the rate of grinding. He also points out that the use of grinding balls with high hardness is possible in determining the rate of grinding.

hard martensitic matrix. In wet grinding, the combined effects of corrosion and abrasion caused much higher rates of wear for all types. The rate of wear in wet grinding, though related to hardness, was substantially independent of alloy additions and massive carbides.

J. H. Brown, A. M. Gordin, and C. M. Loeb, Jr., made a study to determine the effect of heating in the intergranular comminution of various rocks and the applicability to commercial practice. Granite, gneiss, basalt, and marble were treated. It was shown that heating prior to grinding may result in substantially increased friability and in improvement of the size distribution of the ground product. The potential advantages of the method appear to be reduction of crushing or grinding costs, liberation of the valuable minerals at a coarser size, and hence a potential increase in recovery because overgrinding is minimized.

Work is continuing on the design and installation of liners and grinding media. Of interest is the past year's the reported success of No. 1 mill liners in rod mills used for grinding.

A factor of interest in primary heavy-duty crushing is the possibility of eliminating extremely large primary crushers through the use of jet-assisted comminution blasting. Blastings to size 60 mesh or finer are considered to be economically feasible by a number of engineers. How the large-scale use of jet-assisted comminution can be improved.

Three methods of comminution, including crushing, grinding, and jet-assisted comminution, are discussed. The methods are compared on the basis of their efficiency, cost, and the size of the product. The methods are compared on the basis of their efficiency, cost, and the size of the product.

CLASSIFICATION AND SEPARATION
The distinction between flow patterns in a pipe is discussed. The flow velocities and pressure distributions in the pipe were measured under various conditions of flow. The flow velocities and pressure distributions in the pipe were measured under various conditions of flow.

W. L. C. Cameron reports that a new method of separating fine particles from a suspension has been developed. The method involves the use of a special separator. The method involves the use of a special separator. The method involves the use of a special separator.

United States Steel Corporation officials announced that the new No. 1 mill, which is now under construction, will be the largest and most modern of its kind in the world.



Diagram illustrating the separation of fine particles from a suspension. The diagram shows a cross-section of a pipe with a central column of material being separated from the surrounding fluid. The separation is achieved through a combination of gravity and centrifugal forces.

of present mechanically activated screens. The screen cloth itself vibrates and the frame remains stationary. In operation, an electromagnet transmits vibration energy of a fundamental frequency to the screen. Superimposed is a series of harmonics, thus oscillations or ripples are built up which carry to all parts of the screen, leaving no dead areas. The particle-size range handled is from 30 microns to $\frac{1}{2}$ inch.

P. L. Stavenger and V. R. Reynolds reviewed the principles of operation of the DSM screen and indicated the applications in which the unit is being successfully utilized. Field studies have shown that, with slot openings narrower than 0.5 millimeter, separations somewhat finer than one-half the slot width are produced, while with openings wider than 0.5 millimeter separations coarser than one-half the slot width are produced. Comparison tests indicate that the efficiency of the DSM screen is considerably higher than that of a vibrating screen using wedge bars. Capacity is claimed to be much greater than that for a vibrating wedge-bar screen. The chief limitations are (1) the oversize product has a higher moisture content than is normally produced with a vibrating screen, (2) the screen will function properly only within a narrow capacity range, and (3) the recommended limits for the mesh of separation are 6 to 65 mesh (Tyler scale). Applications of the screen in heavy-media circuits, and its use in coal, potash, and taconite plants, are described.

J. E. Fink discussed ways to reduce blinding of screens. Causes of blinding are generally (1) improper operating characteristics, (2) moisture present in the material being screened on finer meshes, or (3) irregular particle shape. The use of electric screen heaters, flame drying, rubber balls, and elongated screen openings were discussed as possible remedies for blinding.

FLOTATION: The field of flotation continued to show a substantial amount of activity during 1958. A variety of fundamental flotation studies and applications of flotation have been described in the literature.

Fundamental Studies

D. W. Fuerstenau, G. W. Mao, and A. M. Gaudin reported on a study of the activation and deactivation with copper on sphalerite. The experimental work with radioactive copper-64 indicated that sphalerite activation was controlled by two processes: (1) rapid uptake of copper ions to form copper sulphide at the surface in exchange for zinc ions and (2) slow diffusion of copper ions into the sphalerite lattice across the copper sulphide layer. Neither cyanide ion or copper cyanide complex ions are adsorbed on sphalerite. Deactivation results from the sequestering of copper

ions as complexes in solution; this reduces the concentration of free ions in solution below that necessary for activation and drives the reaction back.

A quantitative method for evaluating density of slime coating was developed by D. W. Fuerstenau, A. M. Gaudin, and H. L. Miaw. The method was applied to the formation of iron oxide slime coatings on quartz and on corundum. It was found that the slime-coating density was related to flotation recovery and to properties of the electrical double layer at the mineral surface.

A study of the effect of chemical reagents on the motion of single air bubbles in water was reported by D. W. Fuerstenau and C. H. Wayman. The effect of bubble size and concentration of certain reagents on the terminal velocity, shape, path, and drag coefficients of single air bubbles in distilled water was investigated. Bubbles of a certain size range rise considerably faster than Reynolds number-drag coefficient relationships predict, whereas a small amount of frothing agent reduces this terminal velocity. It was found that surface-active agents retard bubble motion through prevention of both circulation and slip at the boundary. Most of the work on this study was concerned with the effect of alpha terpinol on bubble motion, but studies were also made on other reagents including KCl, KOH, ethyl xanthate, and amyl xanthate.

J. Rogers and J. H. Schulman investigated the mechanism of the selective flotation of soluble salts in saturated solutions. Langmuir trough and flotation techniques were used to study the competition between water molecules and ionic compounds for adsorption at soluble crystal surfaces in saturated salt solutions. It was found that, where the attraction between the water molecules and the crystal surface is weak, the ion can adsorb and consequently the crystals will float. Further, if the heat of solution of the salt is positive, no adsorption or flotation occurs, but if sufficiently negative, adsorption and flotation are possible. Heats of solution, and consequently adsorption and flotation, can be radically changed by water of crystallization.

A thermodynamic study of the action of the reagents in mineral flotation was presented by L. Dobrescu. From changes of the mineral surface upon grinding, and chemical changes, e.g., adsorption or oxidation, equations were derived giving the free energy and the true heat of the chemical surface reaction. Wetting of the mineral was expressed by the change of the free energy of wetting and by the heat of wetting. The adherence of minerals to bubbles was expressed in terms of wetting, free energy of adhesion, and heat of adhesion. The total flotation phenomenon was expressed by the

free energy of flotation or by flotation heat. Mathematical results were found to agree qualitatively or semiquantitatively with practical results.

The use of radioactive tracers continued to find wide application in studying flotation phenomena. I. N. Plaksin, S. P. Zaitseva, and R. S. Shafeev discussed tracer methods that have been used to quantitatively measure the nonuniform adsorption of flotation reagents on the surface of sulphide minerals. Their results confirmed the possibility of developing monomolecular layers of xanthates on a mineral surface. I. N. Plaksin and C. A. Myasnikova described the use of radioactive chromium-51 in the study of galena and pyrite depression during selective flotation with ethyl xanthate. The CrO_4 adsorption was affected by the pH of the solution, being 0 at pH 0 and reaching 0.2 milligram per gram at a pH under 6, after which it remained constant. The depressive action of CrO_4 was attributed to the formation of the very slightly soluble normal or basic chromates on the mineral surface. In another investigation of the use of radioactive isotopes, L. G. Erwall described the use of labeling agents to study the flotation mechanism.

C. G. H. Bushell studied the adsorption of xanthate on specific minerals and correlated the results with batch flotation tests on Consolidated Mining and Smelting Company's Sullivan mine ore. He found that the adsorption was a function of the product of the concentration of the xanthate and the hydrogen ions. Increasing xanthate or hydrogen ion concentration in the range where multi-layer adsorption occurs did not decrease flotability. Flotability was a function of the fraction of surface sites occupied by xanthate molecules. Xanthate in the outer layers was considered wasted reagent. At the optimum conditions, consumption of reagents could be minimized by making the xanthate concentration as low as possible and the hydrogen ion concentration as high as possible. When pH was reduced in the Sullivan concentrator, xanthate and lime consumption decreased.

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Ore Dressing

F. C. Bond, Allis Chalmers, defined empirical and theoretical equations for calculating the proper size of balls and rods to be added regularly to tumbling mills. He published a convenient table of ball and rod weights, volumes, and surface areas, as well as tables of the proper ball and rod size distribution for starting up a mill. Rough estimating figures for ball and rod wear were also given.

G. I. Halbert and V. F. Freymann described the practical application to grinding-mill practice of their derivation of an arrangement of balls with the greatest interpenetration. An experimental ball mill with a glass end was built to observe and photograph the action of the balls during operation. A study at progressively increasing speeds showed that a smooth lining can not drive a charge of grinding bodies efficiently. It was concluded that the profile of the lining has a considerable influence on the grinding process, the amount of energy consumed, and the wear of liners and ball or rod charges. To achieve the formation pyramid arrangement with stratification phases perpendicular to the lining, a smooth lining can be covered with round bars parallel to the mill axis. The diameter of these bars theoretically will be 0.73 times the ball diameter and the distance between the axes of the bars would be 1.4 times the ball diameter.

A forum entitled "The Non-Catacting Ball Mill" was conducted by L. E. Djingheuzian with J. F. Myers, H. E. Rose, and R. R. Smith participating. In this forum, operating data were given and analyzed, and the explanations of results were offered. Improved results were reported at Tennessee Copper Company, Cleveland-Cliffs Iron Company's Humboldt and Republic Mills, and Creighton Mill of International Nickel Company using non-catacting ball mills.

R. T. Hukki, Finland Institute of

Technology, described the results of his continuing study of fine grinding at supercritical speeds. A laboratory-size mill was operated under idealized conditions. The principal variables were tumbling charge, friction, and mill speed. On the basis of the results obtained, it is proposed that mills provided with smooth lining, grinding should be possible over a wide supercritical speed range.

F. J. Windolph and E. J. Duggan of American Metal Climax, Inc. reported results of several long-term tests in operating mills. Quantity of ore ground with soft balls was more than with hard balls, based on equivalent time and power consumption. A comparison between 3-inch forged carbon steel balls with a Brinell hardness of 385 and forged hard alloy steel balls with a Brinell hardness of 575 showed an advantage of about 6 percent in tons ground per hour for the softer balls. The difference in rate of grinding is attributed to the comparatively rough surface developed by the softer balls, which probably has a greater nipping effect than the smoother surface. The softer balls do, however, wear at a faster rate. The consumption of balls per ton of ore ground was 24% higher for soft balls.

A radioactive-tracer technique was used by investigators at Battelle Memorial Institute studying relative rates of wear of grinding balls. With this technique it was possible to determine precisely the wear rates of experimental ball samples under actual operating conditions in a commercial mill. The ball characteristics evaluated were composition, heat treatment, and surface treatment. Evaluations were made in a dry-grinding operation on cement clinker and in a wet-grinding operation on cement raw materials. The study showed that the wear rate in dry grinding was lowest when the microstructure of the balls consisted of massive carbides in a

hard martensitic matrix. In wet grinding, the combined effects of corrosion and abrasion caused much higher rates of wear for all types. The rate of wear in wet grinding, though related to hardness, was substantially independent of alloy additions and massive carbides.

J. H. Brown, A. M. Gaudin, and C. M. Loeb, Jr., made a study to determine the effect of heating in the intergranular comminution of various rocks and the applicability to commercial practice. Granite, syenite, taconite, and marble were treated. It was shown that heating prior to crushing may result in substantially increased friability and in improvement of the size distribution of the ground product. The potential advantages of the method appear to be reduction of crushing or grinding costs, liberation of the valuable minerals at a coarser size, and hence a potential increase in recovery because overgrinding is minimized.

Work is continuing on the design and metallurgy of liners and grinding media. Of interest in the past year is the reported success of Ni-Hard shell liners in rod mills used for grinding taconite.

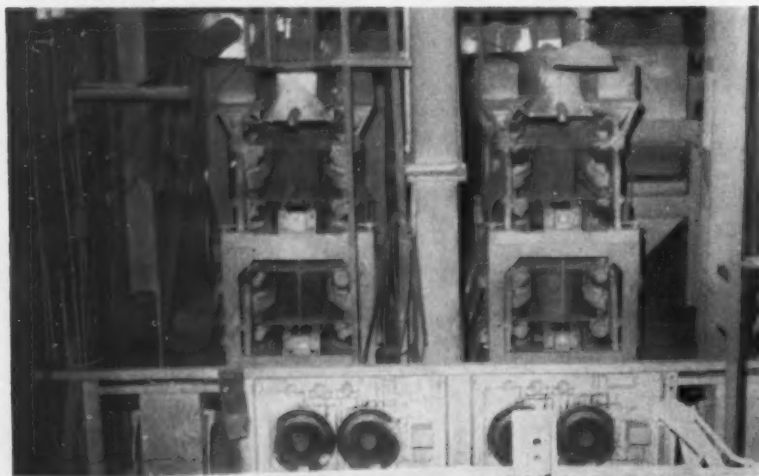
A factor of interest in primary heavy-duty crushing is the possibility of eliminating extremely large gyratory crushers through the use of delayed-action fragmentation blasting. Blasting to a top size of 6 or 8 inches is considered to be economically feasible by a number of engineers. Thus, the large feed opening of a 60-inch gyratory may not be required.

Novel methods of comminution are being examined, among which are high-frequency applications, induction breaking of iron ores, and utilization of electrical discharges. The tremendous tonnages which were broken by the recent underground atomic blast indicate great possibilities for fragmentation of ore in place.

CLASSIFICATION AND SIZING: T. Fujinioto studied flow patterns in a wet cyclone. The flow velocities and pressure distributions in the cyclone were measured under various conditions with a direction-finding pitot tube having a single hole.

R. L. Curfman reports that an improved flowsheet was adopted for sand-slime separation in preparation of the feed for resin-in-pulp extraction (RIP) at the Uranium Reduction Company mill. In the new arrangement, the cyclone underflows are not returned to drag classifiers but are rejected to tailing through a series of washing cyclones. This change enabled the mill capacity to be increased from 1,370 to 1,840 tons per day. Other advantages included a saving in water, lower reagent consumption, and increased recovery.

United Specialties Company of Chicago, Illinois, claim its new Novo sonic screen uses one-third the power for capacities up to five times that



ELECTROMAGNETIC SEPARATION is key to recovery of a columbite-euxenite concentrate and a monazite concentrate at Porter Bros. Corporation's Idaho mill. Feed is heavy minerals from jigs on dredge.

of present mechanically activated screens. The screen cloth itself vibrates and the frame remains stationary. In operation, an electromagnet transmits vibration energy of a fundamental frequency to the screen. Superimposed is a series of harmonics, thus oscillations or ripples are built up which carry to all parts of the screen, leaving no dead areas. The particle-size range handled is from 30 microns to $\frac{1}{2}$ inch.

P. L. Stavenger and V. R. Reynolds reviewed the principles of operation of the DSM screen and indicated the applications in which the unit is being successfully utilized. Field studies have shown that, with slot openings narrower than 0.5 millimeter, separations somewhat finer than one-half the slot width are produced, while with openings wider than 0.5 millimeter separations coarser than one-half the slot width are produced. Comparison tests indicate that the efficiency of the DSM screen is considerably higher than that of a vibrating screen using wedge bars. Capacity is claimed to be much greater than that for a vibrating wedge-bar screen. The chief limitations are (1) the oversize product has a higher moisture content than is normally produced with a vibrating screen, (2) the screen will function properly only within a narrow capacity range, and (3) the recommended limits for the mesh of separation are 6 to 65 mesh (Tyler scale). Applications of the screen in heavy-media circuits, and its use in coal, potash, and taconite plants, are described.

J. E. Fink discussed ways to reduce blinding of screens. Causes of blinding are generally (1) improper operating characteristics, (2) moisture present in the material being screened on finer meshes, or (3) irregular particle shape. The use of electric screen heaters, flame drying, rubber balls, and elongated screen openings were discussed as possible remedies for blinding.

FLOTATION: The field of flotation continued to show a substantial amount of activity during 1958. A variety of fundamental flotation studies and applications of flotation have been described in the literature.

Fundamental Studies

D. W. Fuerstenau, G. W. Mao, and A. M. Gaudin reported on a study of the activation and deactivation with copper on sphalerite. The experimental work with radioactive copper-64 indicated that sphalerite activation was controlled by two processes: (1) rapid uptake of copper ions to form copper sulphide at the surface in exchange for zinc ions and (2) slow diffusion of copper ions into the sphalerite lattice across the copper sulphide layer. Neither cyanide ion or copper cyanide complex ions are adsorbed on sphalerite. Deactivation results from the sequestering of copper

ions as complexes in solution; this reduces the concentration of free ions in solution below that necessary for activation and drives the reaction back.

A quantitative method for evaluating density of slime coating was developed by D. W. Fuerstenau, A. M. Gaudin, and H. L. Miaw. The method was applied to the formation of iron oxide slime coatings on quartz and on corundum. It was found that the slime-coating density was related to flotation recovery and to properties of the electrical double layer at the mineral surface.

A study of the effect of chemical reagents on the motion of single air bubbles in water was reported by D. W. Fuerstenau and C. H. Wayman. The effect of bubble size and concentration of certain reagents on the terminal velocity, shape, path, and drag coefficients of single air bubbles in distilled water was investigated. Bubbles of a certain size range rise considerably faster than Reynolds number-drag coefficient relationships predict, whereas a small amount of frothing agent reduces this terminal velocity. It was found that surface-active agents retard bubble motion through prevention of both circulation and slip at the boundary. Most of the work on this study was concerned with the effect of alpha terpinol on bubble motion, but studies were also made on other reagents including KCl, KOH, ethyl xanthate, and amyl xanthate.

J. Rogers and J. H. Schulman investigated the mechanism of the selective flotation of soluble salts in saturated solutions. Langmuir trough and flotation techniques were used to study the competition between water molecules and ionic compounds for adsorption at soluble crystal surfaces in saturated salt solutions. It was found that, where the attraction between the water molecules and the crystal surface is weak, the ion can adsorb and consequently the crystals will float. Further, if the heat of solution of the salt is positive, no adsorption or flotation occurs, but if sufficiently negative, adsorption and flotation are possible. Heats of solution, and consequently adsorption and flotation, can be radically changed by water of crystallization.

A thermodynamic study of the action of the reagents in mineral flotation was presented by L. Dobrescu. From changes of the mineral surface upon grinding, and chemical changes, e.g., adsorption or oxidation, equations were derived giving the free energy and the true heat of the chemical surface reaction. Wetting of the mineral was expressed by the change of the free energy of wetting and by the heat of wetting. The adherence of minerals to bubbles was expressed in terms of wetting, free energy of adhesion, and heat of adhesion. The total flotation phenomenon was expressed by the

free energy of flotation or by flotation heat. Mathematical results were found to agree qualitatively or semiquantitatively with practical results.

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The 150-by 300-mesh particles showed high floatabilities with and without electrolytes.

The flotation characteristics of the oxides of Fe, Cu, and Zn were studied by J. Shimoizaki in relation to the temperature of their formation. Fe_2O_3 formed at 650° C. showed a maximum floatability of 20 percent; magnetite (Fe_3O_4) showed a 40 per cent floatability at pH 6; ZnO showed results similar to the iron oxides. The differences in floatability with temperature of formation were interpreted as being caused by ionic mobility on the surface of the oxides in the range of temperature where the solid-phase reactions proceed.

Applications of Flotation

The Jones and Laughlin Steel Corporation's Hill Annex tailing reclamation plant at Calumet, Minnesota, was described by H. L. Waldron. The plant is claimed to be the world's first commercial plant to use froth flotation on soft earthy (nonspecular) hematite. The operation consists of (1) dredging, (2) classification in cyclones at 150 mesh, (3) concentration of plus-150-mesh material in a spiral plant, (4) desliming of the minus-150-mesh material at 5 to 20 microns, and (5) flotation of hematite from the deslimed ore with petroleum sulphate, H_2SO_4 , and fuel oil. Seventy-five tons of concentrate are recovered from 150 tons of mill feed per hour.

E. Oberbillig and others described the Holly Minerals Corporation's new three-step process for concentrating mercury from a low-grade ore. The process consists of three separate and distinct operations: (1) crushing, grinding, and flotation, (2) leaching concentrates with sodium sulphide to produce the water-soluble double salt, $\text{HgS}\cdot\text{Na}_2\text{S}$, and (3) electrolytic precipitation of the Hg from the alkaline sulphide solution. The flotation reagents that are used are 610 and NaCN as depressants, CuSO_4 as an activator, R301 as a collector, and F65 as a frother. As pilot-plant test on head ore assaying 0.41 percent Hg yielded a concentrate which assayed 46.8 percent Hg at a recovery of 94.2 percent.

M. Rey studied the differential flotation of lead-zinc minerals in about 90 specimens of different origin. The difference in response to flotation was influenced by the amount and kind of iron sulphides present, by the degree of oxidation, by the basic or acidic character of the gangue, and by the presence or absence of copper minerals. A classification into four groups was proposed. The techniques of separation by flotation in each group and the concentrations obtainable were described.

M. M. Fine and others described a roast-flotation process for upgrading cobalt-nickel concentrates. The stockpiled concentrates, containing a mixture of complex sulphides, were given

a controlled oxidizing roast at 400° C. followed by flotation with conventional sulphidic reagents. A concentrate containing 9.22 percent Co and 11.43 percent Ni at recoveries of 84.9 and 85.8 percent, respectively, was obtained from a feed sample of 2.84 percent Co and 3.57 percent Ni.

I. I. Vanev reported on the replacement of sodium silicate with carboxymethylcellulose in the flotation of a Ni-Cu sulphide ore. The change resulted in higher Ni and Cu contents and lower MgO and SiO_2 contents in the concentrate. Thickening of the concentrate was improved and the size and number of thickeners was decreased.

E. J. Caldwell and H. Rex described the use of flotation to prepare a siliceous flux which is blended with copper concentrates at Magma Copper Company's copper smelter at Superior, Arizona. The charge in flux has reduced fluctuations in slag composition and allows a more suitable charge to be fed to the furnace. Prior to the change, copper concentrates were fluxed with crushed minus- $\frac{1}{8}$ -inch silica. By the new system, a high-grade silica concentrate is prepared by floating pyrite from a portion of the mill scavenger tailing. The resulting tailing from the pyrite flotation section is found to be ideally suited for fluxing purposes.

F. J. Whitthauer reported on the changes in the flowsheet and reagents which enabled the New Jersey Zinc Company's differential flotation mill at Gilman, Colorado to increase slimed lead recovery and improve copper recovery in the lead concentrate. The improved metallurgical results are believed to be partly due to grinding the Cu-Pb-Zn ore in an alkaline circuit.

S. H. Dayton, Associate Editor of MINING WORLD, described the modern 1,000-ton-per day flotation plant which has been constructed by San Francisco Chemical Company to upgrade a western phosphate rock. The essential features of the process are three-stage desliming in cyclones followed by flotation with a fatty acid and Diesel oil. A fluosolids plant now under construction is to be used for eliminating hydrocarbon content of the ore, making it acceptable to the fertilizer trade. See September 1958 MINING WORLD, page 46 to 51.

The flotation mill of the Chibuluma Mines Limited in Northern Rhodesia was described by J. E. Harper. The ore minerals are chalcopyrite and linnaeite. Chalcopyrite is floated with Aerofloat 208 and methyl isobutyl carbinol, while the cobalt mineral is depressed with lime and sodium cyanide. The cobalt mineral is then floated, employing copper sulphate, H_2SO_4 , pine oil, and sodium isopropyl xanthate. The head ore contains 4.77 percent Cu and 0.37 percent Co. A copper concentrate assaying 34.6 percent is produced at a recovery of 93.0 percent and a cobalt concentrate

assaying 4.2 percent is made at a recovery of 80.7 percent.

Scale-up relationships in spodumene flotation were presented by W. E. Horst. The chemistry of spodumene flotation and quality of flotation feed were held constant for laboratory, pilot plant, and plant practice tests to determine the relationship between flotation behavior and scale-up of flotation machines. Flotation rate constants and dimensional analysis were utilized to evaluate the relationship between laboratory, pilot plant, and plant flotation of spodumene. Additional retention time was found to be required in the plant flotation circuit to duplicate either laboratory or pilot-plant results when the operating variables of the plant flotation machines remained unchanged. Actual plant performance with increased retention time substantiated predicted results.

M. G. Fleming described the fundamental flotation characteristics of vanadium minerals and the development of a process for concentrating vanadinite, descloizite, and cerussite from the complex Obenab West ore of the South West Africa Company. The application of the laboratory findings to a 250-ton-per-day plant is also described.

W. J. Trakor presented a review on the flotation of fluorite. The review was primarily concerned with the conditions and reagents used for the flotation of fluorite ore to produce acid-grade fluorite.

V. I. Klassen reported on the flotation of a scheelite-molybdenite ore with fatty acid at reduced temperatures of pulp. It is stated that, for effective utilization in flotation, oleic acid and its soaps must be added as individual molecules and atoms and not in the form of micelles. Results are presented on the flotation of a scheelite-molybdenite ore, which show an extraction of WO_3 with ordinary oleic acid of 42.8 percent at 5° C., and 80.1 percent at 20° C. With dispersed oleic acid, extractions of 83.9 and 80.5 percent were made.

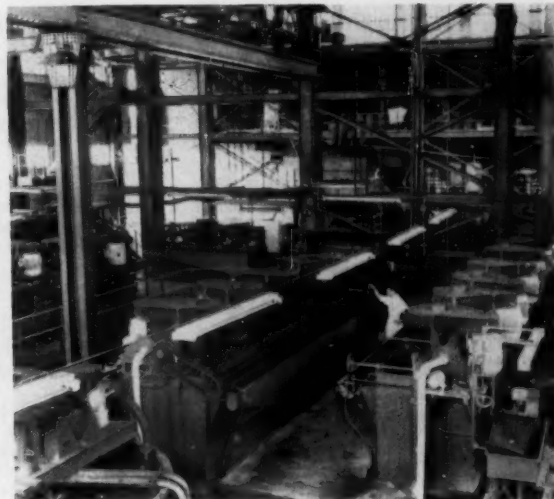
General

MAGNETIC SEPARATION: L. A. Roe, reporting on the advances in magnetic separation of ores, states that magnetic separation of iron ores is a fast-growing segment of the minerals beneficiation industry, and that the quantity of taconite ores processed by magnetic separation methods will reach 100,000,000 tons annually in a few years. Dry magnetic separation continues to be important in processing ceramic raw materials such as kyanite, quartz, aplite, feldspar, and nepheline cyanite.

The Otanmaki Company in Finland is processing ilmenite-magnetite-pyrite ore using wet separators to make a bulk magnetic concentrate and Laurila separators to make a dry separation between magnetite and ilmenite. Earlier work indicated that



FIRST FROTH FLOTATION of soft hematite (nonspecular) on a commercial scale was achieved by Jones and Laughlin Steel Corporation at its Hill Annex mill at Calumet, Minnesota.



COPPER COBALT SEPARATION by flotation at Chibulma Mines Limited is done in these machines where chalcocypirite is first floated and followed by cobalt sulphite, linnaeite.

addition of oleic acid to the bulk concentrates before drying helped to disperse the particles. The commercial plant, however, is now obtaining satisfactory results without an addition.

In Germany, the 30-inch Salzgitter induced-roll-type (dry) magnetic separator is now commercially treating 5 to 6 tons per hour of hematite-goethite ores.

In Sweden and other parts of Scandinavia, the drum-type wet magnetic separator is very popular; both electromagnetic and permanent magnets are used.

In the United States, all of the commercial plants operating on iron ore are wet concentrators. J. E. Forciea, L. G. Hendrickson, and O. E. Palasvirta described the status of magnetic separation for Mesabi taconite. Here the process has a dual effect: not only is it the sale method of concentration, but it greatly reduces grinding costs. Rejection of tailing starts at $\frac{1}{8}$ -inch size. The concentration process is essentially a repetition of moderate size reduction and rejection of nonmagnetics through several stages until a high-grade iron product remains.

E. M. Spokes and D. R. Mitchell made a study of the fundamental relationship of the magnetic susceptibility of the wolframite series of minerals and of sphalerite as related to their chemical compositions. A Gouy-type balance was used to determine susceptibilities. It was observed that the susceptibility varied as the square root of the iron content, either directly, as in sphalerite, or inversely, as in wolframite. The finding is in direct conflict with the commonly accepted concept that the wolframite minerals are nonmagnetic with the exception of ferberite. It was concluded that any ferberite that is unusually magnetic owes this property not to the proportion of iron in the form of tungstate, but to the

presence of iron as magnetite, intimately locked with ferberite. The results indicate that the study of minerals now considered to have susceptibilities too low for magnetic separation should be continued, as present concepts may be erroneous.

ELECTROSTATIC AND HIGH-TENSION SEPARATION: Separation of iron ores in a corona discharge, such as attained in the high-tension separator, have advanced from the laboratory to the pilot-plant stage. It is the opinion of J. H. Carpenter that the high-tension process will be used in a number of large Canadian iron ore processing plants to be built in the next year or two. The interest in dry separation methods is due partly to the climatic conditions in which many of the new ore deposits are found and also to the fact that dry separation methods are improving rapidly. Industrial scale pilot-plant machines for high-tension processing of iron ore are being built for U. S. Steel Corporation and Jones and Laughlin by Carpc in conjunction with Joy Manufacturing Company.

Dings Magnetic Separator Company have added the Coronatron Electrostatic Separator to its line. They report that great strides have been made in such separations as feldspar from silica and in the beneficiation of iron ore to attain an extremely low silica content.

The General Mills electrostatic machine is reported to be the first successful electrostatic device for separating flour mill stocks. It has separated aluminum from aluminum oxide, pure minerals from beach sand, and healthy seeds from inferior seeds of the same size, etc.

E. Northcott and F. N. Oberg described electrostatic separation for beneficiation of coarse Florida pebble phosphate. The feed contains about

60 percent bone phosphate of lime (BPL), which is too low to provide a ready market. The beneficiation process comprised crushing dry to minus-14-mesh, heating to 300 to 400° F., and separation in a LeBaron-Lawver separator with recycling of tailings and middlings. The beneficiated product contains from 73 to 77 percent BPL depending on the mineralogical structure of the pebble and the nature of the silica impurity. Preliminary cost estimates indicate that a plant to treat 500,000 tons of low-grade pebble per year would cost about \$600,000 excluding drying and storage facilities.

E. Northcott and I. M. LeBaron described technological improvements in the beneficiation of feldspar by the LeBaron-Lawver Process. Batch and sub-pilot-plant tests indicated that, given a feed of approximately 8 percent K₂O and 74 percent SiO₂, a product could be made with a K₂O content of 10.5 percent and SiO₂ content of 69.2 percent. This amounts to a recovery of 94 percent of the feldspar.

I. M. LeBaron and W. C. Knopf discussed the application of electrostatics to potash beneficiation. Electrostatic concentration of sylvite has been accomplished when the contaminating minerals were in low percentage. The continuous production of better than 60 percent K₂O concentrate from high potassium sulfate ores has not been demonstrated.

R. E. Barthelemy describes the results of high-tension electrostatic separations made on iron ores from the United States, Canada, and Brazil. Specular hematite has proven to be easily amenable to beneficiation by high tension. Results of separations made on ore from Lake Jeannine in Labrador show that a concentrate can be made which assays 69 percent iron, with a recovery of over 97 percent of the iron. However, when limonite is

present slime interference is acute and limonitic ores require desliming before high-tension treatment. The estimated operating costs on the basis of a minimum capacity of 5,000 tons of iron ore per day, with a requirement of 5.5 feet of rotor per long ton per hour, are as follows:

Maintenance (labor and material), 1.534¢; Power, 0.234¢ and Labor (operating), 2.286¢ for a Total of 4.054¢ per long ton.

These costs do not include grinding, classifying or drying the feed, as might be needed in preparation for the electrostatic separation.

Carpco reports that, by the use of a combination of high-tension, electrostatic, and air classification methods, they have been able to separate mica, feldspar, and quartz simultaneously on the same machine. The first industrial machine of this kind will be installed during 1959. It is also reported that a salable phosphate product has been produced by concentrating the apatite in Swedish iron ores by high-tension separation, and that high-tension separation can now be applied successfully to the removal of silica from uraninite and sulphides in the beneficiation of uranium ores.

GRAVITY CONCENTRATION: A simple mineral concentrator, utilizing vibration, oscillations, and a helical spiral table, is the patented invention of R. M. McNutt. It is circular in design, having a diameter of 10 feet and a height of 11 feet with three complete decks spiralling helically downward. Water-borne ore is whirled down and round from the top to its final outlet at the bottom of the spirals. Three launders carry off concentrates, middlings, or tailings, respectively. The unit has a capacity of 7 to 12 tons per hour and has been tested successfully on a wide range of minerals. It is claimed that the quality of separation is equal to that obtained by other methods and that it effects large savings in capital outlay, time, building space, and labor.

The twin-deck Conenco diagonal deck table has found excellent reception. Deister Concentrator Company, Inc. reports that it shipped 100 of these tables during 1958. This shows that it is worthwhile to improve an older method of concentration as well as to develop new methods.

A new accessory is now available for the Humphreys spiral concentrator. Developed for use on an iron ore in Liberia, the device is essentially a water elutriator which removes the particles that settle most rapidly, usually high-grade concentrate. Use of the device helps avoid the need for sizing the feed before spiral concentration or permits a sharper separation, with the most dense portion removed from the spiral.

R. L. Whitmore made a study of the cycle of a Baum-type jig by simplifying the cycle in stages. He found that the upward water current had two functions, first to transport large

waste particles along sieve bed plates and, second, to provide a density separation between coal and waste. The function of the downward stroke was to reduce the rise in specific gravity of separation which occurred with decreasing size of particles in the feed.

E. O. Lilge and others studied the apparent viscosities of various types of heavy media including galena, ferrosilicon, magnetite, barite, and pyrite. The apparent viscosities were determined in a rotational viscometer and presented in relation to rates of shear. Rates of shear in the Driessen cone were calculated from velocities of medium in the cone obtained from rotational speeds determined by an anemometer. Apparent viscosities were assigned to the cone from the viscometer data for the same rates of shear. The effects of change in the apparent viscosities in the cone were analyzed with respect to all other operating variables and to the mineral-separation efficiency of the cone.

R. G. Wuerker developed a method for establishing a standard to determine the theoretical optimum of a beneficiation process for plant supervision and efficiency control. It was proved that the distribution curves in heavy-media treating of iron ores are merely the reverse of the washability curves in heavy-media testing of coal and that both result from the statistical process of distribution analysis. Implications of the principle of reversibility are discussed, and possible applications to other processes of ore are suggested.

L. D. Muller described the Micro-panner, a small-scale version of the Haultain Superpanner. The unit is designed for the gravity concentration of very small quantities of minerals or other materials, and is intended primarily for use on the stage of a stereoscopic microscope. The panner, its method of operation, and some applications are described and discussed; the alternative use of both heavy and light liquids is indicated.

MINING WORLD reported that 99 percent of the United States output of columbium and tantalum comes from the dredging operation of Porter Brothers Corporation at Bear Valley, Idaho. Yuba jigs are used to produce 150 to 200 tons of concentrate per day. Columbium and tantalum are recovered from the heavy mineral concentrate. See pages 36 to 40 of May 1959 issue.

DEWATERING: Recent trends in filtration equipment indicates attention to new materials of construction and improvement of filter media and auxiliary equipment. Pressure filtration appears to be improving its competitive position with continuous rotary vacuum filters as a result of manufacturers' success in partial automation or mechanization of these batch operations.

C. F. Cornell, R. C. Emmett, and D. A. Dahlstrom described the theory

and design of the Eimco Rotobelt filter and outlined its advantages over conventional drum filters. In all cases cited, the Rotobelt Filter was claimed to have obtained either more complete filtration or achieved substantially better performance than conventional filters.

Dorr-Oliver, Inc. announced the availability of a rotary vacuum filter constructed of Fiberglass. The unit was developed for mildly corrosive applications that normally require special materials of construction. The prototype filter was tested at a uranium mill in the United States where it separated residues from acid-leach solutions. The cost of the plastic filter is less than that of rubber-covered or stainless steel machines of comparable design.

O. E. Palasvirta presented some data on the effects of demagnetizing magnetic concentrates prior to filtration. The merits of demagnetizing were as follows:

(1) The well-dispersed pulp showed less tendency to settle in the filter tank. (2) Cake formation was more even because the filter pool was homogeneous. (3) A dense cake was attained during the forming period because flocs were absent. (4) The cake did not tend to crack. (5) The drier cake was produced. (6) A shorter drying period was necessary, permitting higher operating speed and resultant increase in capacity. (7) Density of the feed pulp could be kept as high as the equipment can handle.

A. M. Gaudin and D. W. Fuerstenau described the Transviewer, a new tool that enables metallurgists to determine the concentration of solids in suspension at any given time in a settling system. X-rays are used to scan the total column being studied at short-intervals, and a record of the solids concentration is made based on the extent to which the X-rays are absorbed. The Transviewer promises to be applicable not only in the study of thickening, but also in classification, fluid-solid systems, jigging, mixing vessels, and flotation pulps.

AUTOMATION AND CONTROL: In the minerals beneficiation industry, as in other industries, interest in automatic operation and control increases with the dual objective of reducing the cost and of improving the process. 1958 saw substantial progress toward realization of automatic concentration plants but few, if any, spectacular breakthroughs.

C. M. Marquardt described the Homestake-New Mexico Partners' New Mexico uranium mill which was designed to use maximum process control with minimum labor. The controls include: (1) A ball mill dilution controller, (2) Weight-controlling scales, (3) Pulp-density controllers, (4) Temperature controllers, (5) Level Controllers adjusted by speed of diaphragm pumps, (6) Pregnant-solution flowmeter, (7) NaOH controller, and (8) Temperature controller on driers.

Largely as a result of the instrumentation and control employed, this plant is being operated with approximately two-thirds of the originally estimated manpower.

J. R. Riede described the use of gamma-ray gauges in beneficiation plants to measure percentage solids, density, or specific gravity of slurries. The paper describes how the gauges work, their advantages, cost and reliability. Some of the existing installations are discussed and other ideal applications in the beneficiation industry are pointed out.

J. McCaslin discussed the basic concepts of instrumentation and the areas of application to the mineral industries. Descriptions are given of the theory and methods of measuring: (1) Temperature, (2) Pressure, (3) Strain, (4), Flow, (5) Position, and (6) Vibration.

T. L. Mell described an electronic scale for measuring the flow of bulk material on conveyor belts. The system uses the electric strain-gauge load cell, industrial potentiometric recording instruments, and automatic controllers capable of operating various types of feeders. Advantages of the system include lower costs, better product uniformity, and higher production because the equipment is operated at its capacity.

MATERIALS HANDLING: The use of pipelines for handling slurries is now firmly established. In one application a 6-inch-diameter, 72-mile pipeline carries gilsonite over mountainous terrain for delivery to the refinery. This line transports 200 tons per day of minus-8-mesh solids in a suspension that contains approximately 35 percent solids. Plunger pumps force the slurry over a mountain pass 2,700 feet above the initial pumping station. In the second application, a 10½-inch line 108 miles long transports 75 tons per hour of minus-14-mesh coal in a suspension that contains approximately 50 percent solids.

It is possible that solid sulfur in slurry form may move through a 500-mile pipeline from Alberta natural-gas fields to the Pacific Coast. On the other hand, studies made by the U. S. Bureau of Mines indicate that pipeline transportation of Texas lignite for less than 100 miles would cost more than moving by truck or rail, because of degradation of the lignite in the line and the high cost of dewatering it for use.

The conveyor system carrying 1,000 tons per hour of quarried rock to Ideal Cement Company's plant at Ada, Oklahoma, will include the world's largest individual span, according to Link-Belt Company. The 5½-mile conveyor will include seven spans. The longest span will cover 12,000 feet using a 36-inch-wide rubber belt more than 4 miles long.

The Chesapeake and Ohio Railroad completed the installation of a cardumping boat-loading system at its docks in Toledo, Ohio, which features

a Wellmann double-car rotary dumper and a conveying and boat-loading system with an 8-foot-wide belt. This is the widest belt in use in the United States. The expected capacity of the system is 6,000 tons per hour.

MILL DESIGN: There appears to be little or no chance for revival of the smaller operations in the mining and milling of our metal ores. It is expected that the size of the plants will continue to increase. On the other hand, it is expected that the number of small operations in mining and milling of nonmetallic minerals will continue to increase.

W. Jurden related how Anaconda-Jurden Associates achieve modern industrial design. He emphasizes that successful modern design can be achieved only by the cooperative efforts of specialists. When asked what he aimed to achieve in modern plant design, Mr. Jurden said "It must be efficient, it must be economical in both design and operation, it must be free from unproven or experimental equipment, and it should be architecturally attractive."

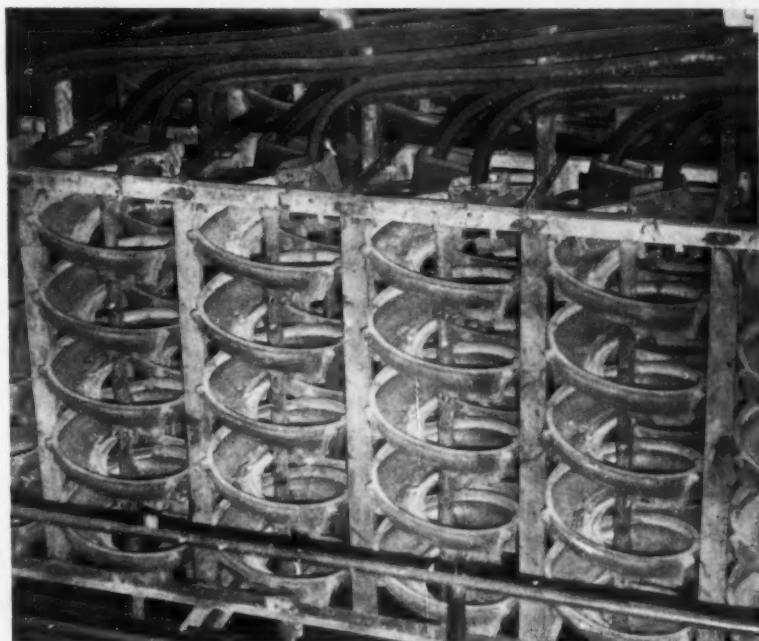
GENERAL: Messrs. J. Kelley and J. F. Hutter of Bicroft Uranium Mines, Ltd., have developed an electronic waste-rock picker that rejects 200 tons per day of plus-3-inch waste rock from the feed to the Bicroft mill. The use of the sorter is expected to save \$400 a day in milling costs by increasing the capacity of the grinding mill and by reducing reagent costs. Although the Electronic Sorter was developed primarily for treating uranium ores, the inventors expect to find

wide application in other areas.

Kennecott Copper Corporation released information on the bacteria leaching of ores containing sulphides and/or iron sulphate. According to S. Zimmerley, director of research, and one of the inventors of the patented process, Kennecott found that several strains of iron-oxidizing autotrophic bacteria occur naturally in mine waters at Bingham Canyon, Utah, and Chino, New Mexico. These bacteria are able to live and multiply in relatively high concentrations of dissolved copper and can be used to leach and recover copper, molybdenum, and zinc from their sulphide or mixed oxide-sulphide ores. In addition, processes have been developed that use bacteria to upgrade iron-chromite and iron-titanium materials by leaching out the iron.

E. C. Perkins and F. Novielli reported on a preliminary study of bacteria leaching of manganese ore which took place at the U. S. Bureau of Mines Electrometallurgical Experiment Station.

S. H. Dayton, Associate Editor of MINING WORLD described the mill of Porter Brothers Corporation, which utilizes a combination of electromagnetic, high-tension, and gravity separation methods to recover columbite-euxenite and monazite concentrates. Electromagnetic separation is used to scalp out minerals of high magnetic susceptibility, such as magnetite and ilmenite. Subsequently, monazite and columbite-euxenite are separated by high-tension means. Air tabling and wet tabling are then used to upgrade the high-tension concentrates.



CLIMAX MOLYBDENUM COMPANY'S new byproduct plant treats 32,000 daily tons of molybdenite tailing containing 0.03 percent WO_3 , 1.25 percent FeS_2 , and a trace of Sn. Key concentration units are 704 Humphrey's spirals.

Physical-Chemical Metallurgy Centers

On Ion Migration and Fused Salts



By C. J. LEWIS

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There was an encouraging amount of research in the field of hydrometallurgy during 1958; such research may be described as possessing a healthy undertone of long range promise. However, the application of new or substantially improved hydrometallurgical techniques in the mining industry during 1958 was relatively minor.

Hydrometallurgical improvements in the production of uranium concentrates were probably the most outstanding. A new ion exchange resin operation, utilizing the principle of a continuously recycling resin bead charge (as contrasted with column ion exchange and RIP processes) was brought into successful operation at the Maybell, Colorado, uranium mill of Union Carbide Nuclear Company. The Kermac Nuclear Fuels Corporation started operation of the largest uranium mill in the United States at Grants, New Mexico, using the solvent extraction process and a trifatty amine extractant, thus further adding to the trend toward amine extraction reagents at the expense of the once popular organo-phosphate extractants.

New Solvent Extractant

A development by the U. S. Bureau of Mines in Salt Lake City, Utah, involving the use of a mixed amine-organo-phosphate extractant, resulted in an application of this extractant combination to the recovery of both vanadium and uranium from solutions of the Vanadium Corporation of America at Durango, Colorado. Finally, it is noteworthy that the Allied Chemical Company announced the startup of liquid fluorine operations at

Metropolis, Illinois, as the initial operation of a plant which will produce uranium tetrafluoride (green salt) at a rate equivalent to 5,000 tons U_3O_8 per year.

Although hydrometallurgical operations in the mining industry were for the most part curtailed in 1958 due to the overall economic situation in the industry; there were some encouraging exceptions. Cuban-American Nickel Company pushed construction on its \$119,000,000 project at Mao Bay, Oriente Province, Cuba, for producing nickel cobalt concentrate by leaching with sulfuric acid at elevated temperatures and pressures. The leaching plant alone is designed to treat some 2,300,000 gallons of mixed ore and acid daily and it is expected that this plant will be in operation in the summer of 1959. Construction also progressed on what may eventually be the world's largest aluminum plant, the Fria Compagnie Internationale in French Guinea. Aluminum capacity also received another big boost from Ormet Corporation's \$55,000,000 development at Burnside, Louisiana. This operation is designed to provide some 345,000 tons of alumina per year. Much more use of aluminum is forecast; Alcoa expects process industries to triple use of aluminum, now 4 percent of that produced, by 1961. Likewise 1958 witnessed an expansion in the production of tantalum and columbium. Fansteel Metallurgical Corporation started up its new tantalum and columbium plant near Muskogee, Oklahoma, increasing Fansteel tantalum production by 50 percent and columbium by 150 percent. The process used is essentially a crystallization operation.

Metals and New Uses

Metals primarily in the limelight and which achieved stature in 1958 were titanium, columbium, molybdenum, chromium, zirconium, tantalum, vanadium, and silicon. This is because of the increasing demands of the automotive, aircraft, atomic energy, electrical, oil, chemical, and electronic fields for materials capable of withstanding higher and higher temperatures while still retaining the necessary properties with respect to weight, resistance to creep, corrosion, etc.

Reference has already been made to increased vanadium recovery by solvent extraction and to expanded facilities for production of columbium. However, major metallurgical developments in this "space age" group of metals in 1958 were at the laboratory or pilot plant level. An informative article on this subject appeared in the May 1958 *Journal of Metals* entitled "New Metals Face the Future," by

Brown and Fountain. Of course, other metals shared the spotlight at times, particularly lithium. Although the action with reference to the renewal of AEC contracts for lithium chemicals jolted lithium metal producers, Foote Minerals Company announced newly developed forms of lithium which forecast many new possible uses for this metal. Among such uses may be mentioned, catalytic polymerizations replacement of alkali metal hydrides, and the use of lithium systems in the Grignard, Friedel-Crafts and other organic reactions.

Battelle Memorial Institute announced a new "iodide" process for producing chromium containing as little as 10 parts per million of impurities. Free State Geduld Mines Ltd. in the Orange Free State released information regarding the world's first large scale de-salting plant. This plant uses an electrodialysis process which possibly forecasts economic means for the de-mineralization of mine water and the recovery of valuable metals now being discarded.

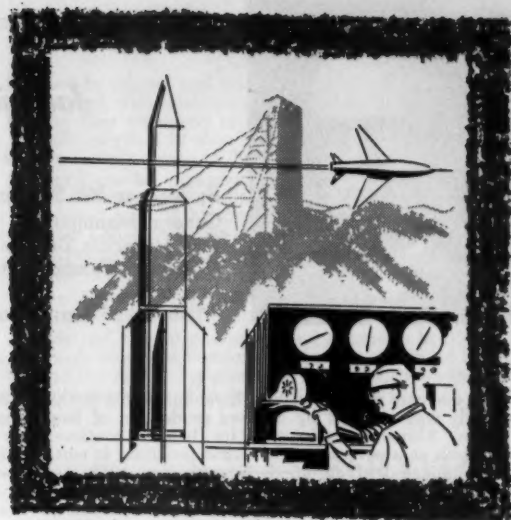
Research on Many Fronts

Ion migration or electrophoresis received increased attention in 1958 as a means for separating mixed ions. For example when copper, nickel, and cobalt are dissolved in sulfuric acid and the solution contained in a system of electrodes separated by a wet membrane, the copper migrates to one position, cobalt to another, and nickel to still another depending on the electrical negativity of the metal ion and the nature of the current. Kennecott Copper Corporation as well as the U. S. Bureau of Mines reported on the use of certain micro-organisms for leaching sulfide minerals and manganese oxides.

The Colorado School of Mines Research Foundation investigated ore leaching and metal precipitation at elevated temperatures and pressures, as well as the effect of subfreezing temperatures on ion migration. In particular, the solubility of some metal sulfates was found to be radically effected by temperature extremes, thus forecasting new hydrometallurgical developments.

Finally, it may be noted that fused salt chemistry received additional attention. In this development, fused salts, commonly referred to as the largest known class of non-aqueous inorganic solvents, are being investigated with reference to their ability to dissolve metals and concentrates after which purified metals and compounds may be recovered by electrolysis, crystallization or even precipitation. For example, Stanford Research Institute reports that nickel has appreciable solubility in molten nickel chloride, while iron and cobalt have little or no solubility in their fused salts.

All of the foregoing developments whether classed as hydrometallurgical, chemical or physical-chemical continue to forecast great strides in the winning of metals from their ores.



Review and Forecast of **METALS** and **MINERALS**

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By George W. Streepey
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Jamaica is the chief source of bauxite

The decrease in demand for aluminum during the year 1958 generally was reflected by a lower production of bauxite and alumina. Although exploration for bauxite continued on a wide basis, it was reported that some programs in certain areas were eliminated or curtailed. Nevertheless, 1958 was a year of many new events in the aluminum industry, from raw materials to finished products. Some major developments were:

1. May, 1958: Suspension of tariff on crude bauxite, calcined bauxite, and alumina used for aluminum production, continued until July, 1960.

2. In January Alcoa announced that its subsidiary, the Suriname Aluminum Company, had signed an agreement with the Suriname government which extended the life of existing bauxite concessions to 75 years, designated new areas for bauxite exploration concessions, and provided for the construction of a hydroelectric works, smelter and eventual refining plant in Suriname.

3. Alcoa, late in the year, started Dominican Republic mining operations preparatory to first shipments of bauxite to the United States early in 1959.

4. In January, Reynolds Metal Company tapped the first of three potlines in its new Listerhill, Alabama, smelter.

5. Ormet Corporation commenced operations at its new smelter at Omal, Ohio, and its new alumina plant at Burnside, Louisiana, using bauxite imported from Suriname.

6. Operations began at Kaiser Aluminum and Chemical Corporation's Ravenswood, West Virginia.

7. Alcoa and Kaiser Aluminum concessions in Panama were ratified by the Panamanian Congress.

8. Anaconda Aluminum Company started the first test runs at its 50 tons per day alumina-from-clay pilot plant at Anaconda, Montana.

9. Harvey Aluminum Company started primary production at its new smelter at The Dalles, Oregon, using alumina from Japan. This raised the number of primary producing companies in the United States to a total of six: Alcoa, Anaconda, Harvey, Kaiser, Ormet, and Reynolds.

10. Olin-Mathieson Chemical Corporation reported it had joined an international company, with four foreign concerns, to mine and develop African bauxite deposits for production of alumina in West Africa.

Domestic bauxite output for the first three quarters of 1958 totaled 971,167 long tons—a decrease of 13 percent over the same period in 1957. However, third quarter production showed a 31 percent increase over second quarter tonnage.

Another new nine-month high was set for imports of bauxite when they reached a total of 5,923,118 long tons, up 17 percent from the like period of 1957. Stockpiling played an important part in this record-setting gain.

Largest share of bauxite imports was supplied by Jamaica for the three quarters, with shipments amounting to 62.2 percent of the total. Suriname followed with 30.5 percent; Haiti, 4.4; and British Guiana, 2.9.

The upward trend of aluminum consumption since the 1958 first quarter low is fully expected to continue in 1959, and shipments to consumers are confidently predicted to exceed 1958 totals by better than 10 percent.

During 1958, the industry was encouraged by the apparent increase in use of aluminum per unit of durable goods produced. Growing applications for the metal in such fields as passenger automobiles and building construction offset to some degree the sharply reduced output of many aluminum-consuming durables during the 1957-1958 recession.

Final surveys indicated that average use of aluminum in 1958 passenger cars reached approximately 50 pounds, an increase of nearly 25 percent over 1957. Aluminum found its way into an increasing number of functional parts, such as the front wheel brake drums on the 1958 Buick, and continued to be used for still more trim and decorative parts.

In the building field, moderately priced homes are available in three models which use from 1,400 to 3,000 pounds of aluminum. Usage of aluminum in the average new home still is less than 100 pounds per unit.

Aluminum made important inroads in the electrical field during 1958. Attractively priced aluminum magnet wire became available for such devices as motors, solenoids, and generators.

Included among a number of significant research and development achievements during 1958 were: X5457, a new aluminum sheet alloy, with a bright finish for automotive trim; X250, a new high strength aluminum sand casting alloy; X385, a new aluminum die cast bearing alloy; a new high strength alloy for truck bodies; a lower priced sheet for porcelain enameling; and the first resealable aluminum closures for canned infants' foods.

BORON

Although production figures for boron are not available, it is safe to assume that production has been steadily increasing as activity in boron high-energy fuels has increased. Sales of boron minerals and compounds in 1958 increased to about 690,000 short tons, gross weight, in 1958, with a B_2O_3 content of about 340,000 short tons. This compared with 1957 sales of 597,857 short tons, gross weight, with a B_2O_3 content of 293,483 short tons.

There was greatly accelerated exploration activity in Southern California during the year. Kerr-McGee Oil Industries Inc. launched a full-scale exploration program for saline deposits in the Mojave Desert on about 14,000 acres of land leased from Southern Pacific Land Company. Sunray Mid-Continent Oil Company of Tulsa, Oklahoma had a six-man crew seeking boron and other minerals in the same desert area. Kern County Land Company actually discovered large amounts of colemanite or calcium borate on property in the East Kramer area of the Mojave Desert. Reserves are estimated at 40,000,000 tons, with an average grade of 14 percent boric oxide. Although sodium borates are considered more desirable at the present time because of metallurgical processing, federal law requires that sodium borate minerals be reserved for the government, so

the firm is pleased not to lose the property. New technological developments have increased the importance of boric acid and boric oxide.

During the year, a large colemanite discovery was made in Turkey. The find is now being developed by the Etibank. Reserves are estimated at 7,000,000 tons. Argentina, West Germany, and Italy also have boron deposits.

U.S. Borax & Chemical Corporations Pacific Coast Borax Division announced during the year that it would increase its boric acid production at Wilmington, California to meet the increased demand from many industries and to supply imminent requirements of the boron fuel manufacturers. The division had recently received contracts from Olin Mathieson Chemical Corporation and Callery Chemical Company. Plant recovery at the company's operation at Boron, California was materially increased. Some difficulties had been encountered in initial operations. The new open pit mine operated on schedule. The firm's \$20,000,000 project now supplies about 70 percent of the Free World's needs.

Other California producers are American Potash & Chemical Corporation and West End Division of Stauffer Chemical Corporation.

ASBESTOS

In asbestos the year 1958 saw an increase in Free World capacity of about 25 percent, reduction in Canadian shipments below 1,000,000 tons for the first time in three years, the strengthening of Russia's position as an important exporter, the start of production by three new Canadian mines, the Kennecott Copper Corporation acquiring a large asbestos deposit in Greece, and the ending of the United States government purchase program.

Not surprising, some 20 percent of expansion was in Quebec, Canada. ASARCO's subsidiary—Lake Asbestos of Canada Limited—placed its 5,000-ton-per-day milling plant in operation to treat open-pit ore after removing 27,000,000 cubic yards of silt and gravel at the bottom of Black Lake. National Gypsum Company's subsidiary—National Asbestos Mines Limited—started its open-pit mine and 3,000-ton mill. The third new Canadian mill was that of Philip Carey Manufacturing Company Limited whose subsidiary—Carey Canadian Mines Limited—started its new 2,500-ton mill and open-pit mine.

Declines in volume and value of all types of Canadian fiber were recorded, with total output being 942,135 tons.

Russian fiber continued to be offered on European markets to the adverse effect of Free World production. Sales were extended to Latin America in the latter part of the year.

Further Canadian expansion is underway as Advocate Mines Limited's Baie Verte deposits in northern Newfoundland will be developed for a 3,000-ton mill by an international group headed by Canadian Johns-Manville Limited.

Exploration in British Columbia and the Yukon was active by Cassiar Asbestos Corporation and Conwest Exploration Ltd.

Metate Asbestos Corporation built a mill at Globe, Arizona to treat ore mined at a number of small mines.

At year end, rate of production and shipments had increased in line with improved business. Production should be larger in 1959 and the rate of expansion by producers shows their faith in sharply increasing sales in years ahead.

BERYLLIUM

Production and use of beryllium metal reached an all time high in the United States in 1958. However, mine production of beryl ore declined in the United States, and abroad, as did imports of beryl to the United States. About 6,200 tons of beryls were used.

An estimated 5,520 tons of newly mined beryl was available to metal producers of which about 525 short tons were mined by some 200 domestic producers. Of this some 420 tons were stockpiled. Most domestic production was bought by the Federal government under the purchase program; purchases at year's end were about 2,250 of the 4,500 tons authorized before 30 June 1962.

Imports followed the historic pattern from Argentina, Brazil, India, Belgian Congo, and Mozambique; the latter two of growing importance in last few years. Despite the greater use than production there is no foreseeable shortage of beryl for any anticipated use because 1.75 times as much beryl has been mined in last 23 years as used.

The greatest interest in beryllium shifted from nuclear applications to space age weapons during the year. Beryllium's

extreme lightness to stiffness ratio, its strength weight ratio, and thermo properties make it desirable for nose cones. Its use as a structural material grew as the Brush Beryllium Corporation produced metal in pieces up to 64 inches in diameter and weighing over 2,500 pounds. Sheets in sizes up to 30 by 60 inches were also available. Continuing developments in rolling, forging, extruding, composite bodies, missile structures, crack-propagation, and joining and casting point to expanded application of the metal.

Nuclear demand and uses apparently dropped as the Atomic Energy Commission cut back its two 100,000 pound annual contracts to 37,500 pounds on June 30th.

Interest in mining and processing of beryl reached unprecedented heights in Colorado. Several flotation mills were built and mining was active at several of the better known pegmatites in the Front Range. However, one of the major buyers of beryl reported that this beneficiation activity was not productive of any saleable products.

Beryllium continues to be a growth metal. For 1959 7,000 tons are predicted to be used and 7,770 in 1960.

CHROMIUM

The end of the United States government's domestic chromite program in mid-1958, the start of an experimental electric furnace high carbon ferrochrome plant by American Chrome Company at Nye, Montana, and the importation from Russia of 80,000 tons of chrome ore, via Canada, in ferro alloys forms, highlighted the chrome picture in 1958.

By far the largest domestic producer was American Chrome, with 123,000 tons of concentrate. California mines were second at 20,500, and Oregon third with 4,000. Nearly all the California and Oregon production was during the first half of year from many small underground and several large California open-pit mines. When the domestic program closed, surveys in California indicated a minimum of 113,000 tons of milling grade

ore available for mining. The Oregon mines also had tens of thousands of tons of developed ore. Thus, the chrome purchase program ended with far more developed reserves than when program started.

Total imports were about 1,250,000 tons (850,000 metallurgical, 225,000 refractory, and 175,000 chemical). Consumption was about 1,175,000 tons. Turkey and the Federation of Rhodesia and Nyasaland were leading exporters of metallurgical chromite, the Philippine Islands, Cuba, and South Africa of refractory grade, and South Africa of chemical grade.

American Chrome is the only important domestic producer with two-thirds of its government contract filled. Research on ferrochromium production offers hope for industrial markets.

COBALT

The United States was the world's largest second mine producer of cobalt in 1958 with an estimated 4,800,000 pounds of metal. Canada dropped to third with 2,521,240. The Belgian Congo continued in first place despite drop in production. Northern Rhodesia and Morocco continued to be other important producers.

All three United States primary producers—Calera Mining Company, Idaho; National Lead Company, Missouri; and Pyrites Company, Delaware—increased output. This high production doesn't mean a favorable outlook, however, because at least two of these companies will be forced to close when government contracts expire shortly.

The outlook is for the major foreign companies to consolidate their position as leading producers as new mines, new mills, and

plant additions are completed in 1959 and 1960. Union Minière du Haut Katanga, world's largest producer, is building a new hydrometallurgical plant at Kolwezi, Belgian Congo; Freeport Nickel Company's new mines and mill will go into production at Moa Bay, Cuba (nickel is a byproduct) in 1959 with all sales to United States government. All Canadian production is a by-product of silver and nickel so that production is expected to remain fairly stable. Northern Rhodesia's output is copper by-product from Chibuluma Mines Ltd. and Rhokana Corporation. Chibuluma sells under contract to the United States government.

Thus the United States government will continue to play an important part in maintaining foreign production. There is no foreseeable shortage of cobalt for all peaceful needs.



By Stanley H. Dayton
Associate Editor

Mine expansions guarantee adequate copper

The world-wide copper industry was characterized by several cross trends in 1958. In the United States consumption was off seven percent. In complete contrast, demand in Europe remained at a fairly high level. At the beginning of 1958, U. S. copper supplies were way ahead of demand, and producers were sagging under the weight of accumulate inventories. At the end of the year supplies had tightened up and producer inventories were at the lowest point since 1955. In Europe, however, supplies of electrolytic shapes were never plentiful at any time during the year.

For the year as a whole these figures were noted. Mine production of copper in the United States was down 10 percent from the 1957 figure. Refinery output of copper in the United States from domestic and foreign sources was eight percent less than in 1957. Copper started the year 1958 at a price of \$0.27 per pound and ended the year at a price of \$0.29. Between those dates copper sagged to a price of \$0.25 per pound late in January and remained there until the middle of June 1958. At about mid-year, the changes in the national economy of the United States began to have a beneficial effect on the copper industry. Demand for copper began to rise in the second half of the year and consumption of refined copper was 19 percent above that for the first six months of the year. The monthly consumption rate in the U. S. for the period October through December was a whopping 32 percent higher than the average for January through June, and a healthy 11 percent above the rate for all of 1957.

Abroad, copper production fell in almost every producing nation with the exception of Peru and the Philippine Islands.

Most of the United States producers cut production 10 percent or more during the year by reducing the work week from seven days to five days, and, in some cases to four days. These cuts in production were effective during the first half of 1958. At the end of 1958 most U. S. producers had gone back to six and seven day work weeks. Chile, Belgian Congo, and mines of The Rhodesian Anglo American, Ltd. announced similar cuts of 10 percent during the year. Strikes took a cut from normal output at Chino Mines Division of Kennecott Copper Corporation, Chile Exploration Company's Chuquibambilla mine, Northern Rhodesian mines, International Nickel Company's operations at Sudbury, Ontario, Canada, and at the El Paso, Texas refinery of Phelps Dodge Corporation.

During the year, these developments took place in copper. After a seven year suspension, the excise tax on copper imports was reimposed July 1, 1958. The effective rate was \$0.017 per pound as a result of the General Agreements on Tariff and Trade (GATT) meetings in Geneva in 1956. The \$0.017 per pound rate is to remain effective when the price of copper is \$0.24 per pound or better. When the price drops below \$0.24 per pound, the tariff rises to \$0.02 a pound.

In May, Chile urged the United Nations to take action to

promote increased stability of copper prices. Later in the year during a Paris meeting of the International Wrought Non Ferrous Metals Council, to which most of the leading copper producers were invited, it was agreed that there was no need for international or inter-governmental action with regard to copper.

United States export controls on copper were relaxed further in 1958. The Department of Commerce announced that effective November 10, copper products, including ore, concentrate, scrap, refined, and copper-base scrap, were removed from the list of materials requiring an export license and placed on the general list for export to all destinations except Hong Kong, Macao, and the Sino-Soviet bloc.

Great Britain likewise relaxed controls on the sale of copper, and in the final quarter of the year, Russia came into the market buying significant quantities of copper.

For the future, one expert has estimated an average price of \$0.36 to \$0.37 per pound for copper for the next 10 years. This estimate was made by Arthur Notman, long noted as a leading American copper economist. He said that the above price was needed to match present costs and meet the demands of growing populations. To get that average said Mr. Notman, low years such as 1958 must be matched by high years of 46 cent copper, for example. He estimates that 80 percent of the Free World copper production costs an average of \$0.20 per pound to obtain before depreciation and income taxes, and the balance of the Free World output costs \$0.25 per pound. His estimates are based on historical returns on investment of about 25 percent in the copper industry.

Clyde Weed, chairman of the board, The Anaconda Company, recently stated that African copper is produced at a cost of between \$0.18 and \$0.20 per pound. The lowest cost mine in the U. S. he said because of molybdenum and gold credit, mines copper at about \$0.15 to \$0.16 per pound. The large mines in Chile recover copper at a cost somewhat less than the cost of Rhodesian copper. The top third of our domestic production requires a copper price above \$0.28 a pound in order to operate profitably for any period of time.

By 1962 it is estimated that Free World copper capacity will be about 3,900,000 to 4,000,000 tons per year. This is roughly 25 percent more than the present estimated capacity of 3,300,000 tons. The increase will come from Southern Peru Copper Corporation, scheduled for production in 1960, the El Salvador project of The Anaconda Company in Peru, scheduled for initial operation in mid 1959 and by new mines in Northern Rhodesia controlled by American Metal Climax, Inc. Rhodesian Anglo American Corporation, and by Union Minière du Haut Katanga in the Belgian Congo.

The year 1958 will probably go down in history as a period of readjustment for the copper industry. It was also a year of reappraisal for the producers during which an important concept crystallized. This concept embraces the fact that new capacity and expansion projects guarantee the availability of adequate supplies of copper at a reasonable price. Thus producers are trying to sell the idea that copper will not be subject to the violent fluctuations in price which have characterized the industry in the past. At the moment this concept is entirely true, and producers can correct the low inventory of copper by rising production. The strike threat, however, could upset this balance. This will be a year of negotiation between labor and management on many labor contracts in the copper industry which expire this summer.

GOLD

In the United States there were two important gold developments during 1958. The first was the adverse reversal of the Court of Claims ruling by the United States Supreme Court in midyear to find that domestic gold producers were not entitled to damages caused by World War II forced closing of mines. The second event was the continuing flow of gold reserves to foreign countries. Outflowing totalled \$2,251,000,000 in contrast to only \$779,000,000 in 1957. Various reasons for this have been given, such as low short term interest rates in United States compared to higher rates abroad, the feeling abroad that there might be an upward adjustment in United States price, and the reduction in United States exports which were payable in

gold.

An increase in the \$35.00 price of gold was discussed at two important international meetings. The first, in September, was by the finance ministers of the British Commonwealth nations. The second, in October, was the International Monetary Fund Meeting. The Union of South Africa was the strongest advocate of a price increase and received strong support from several Commonwealth nations. In the United States, the Treasury Department officially denied plans or need for an increase. However, the federal government was cognizant of the need for an increase in the face of spiralling inflation. The Federal Reserve took a series of measures to defer the recognized increase need

by squeezing credit, and by reducing bank reserve requirements to stretch out use of gold reserves.

United States production declined to 1,736,352 ounces with the cut back in base metal production and the consequent drop in byproduct gold output. Placer gold production increased, largely as a result of resumption of operations by Round Mountain Gold Dredging Company at Round Mountain, Nevada. Placer output in Alaska was unchanged from 1957, while California was up 4.0 percent.

Idaho output of 14,660 ounces was the highest since 1953, largely due to increased recovery from cobalt-copper ore mined by Calera Mining Company. With larger tonnages of much higher grade ore mined in 1958, the Knob Hill, Washington mine of Knob Hill Mines Inc. continued as a major gold producer. Homestake Mining Company's Lead, South Dakota mine was again the largest producer.

Canada was the scene of increased activity. Gold production was up to 4,537,007 ounces from 4,433,894 in 1957. Exploration increased, particularly in the Red Lake, Ontario area, and Northwest Territories; placer interest increased in British Columbia. The Emergency Gold Mining Assistance Act was extended until the end of 1960 and assistance increased by 25 percent of Cost Aid payable as calculated by cost formula. Mines with cost per ounce in excess of \$26.50 are eligible. Gold

mining continued as a large and important industry with operations in all provinces. In value gold was exceeded only by uranium, nickel, and copper.

South African production was increased to an all-time high of 17,656,447 ounces; up from 17,030,737 in 1957. However, indications are that further expansion of output will not be large—and, in fact, output will decline in a few years as several of the larger and older mines will be worked out.

Production in the Philippine Islands, Australia, Ghana, and Southern Rhodesia increased. Production in other large gold mining countries—Mexico, Colombia, Chile, Nicaragua, India, and the Belgian Congo—was little changed from 1957.

Phillip Cortney, international business leader and gold authority, outlined the Russian gold position in a letter to the *Wall Street Journal*. He pointed out that one of the European fears for a higher gold price was that it would aid Russia. This is not in accordance with facts and he clearly outlined why a price increase would not help Russia. He said:

"The real danger to the free world is that the Russians may buy our gold and not that they may sell us theirs. Gold renders such an irreplaceable and valuable service to the Free World as a basis of its currency system that the advantages the Russians may get from a higher gold price are minor compared with the benefits the Free World would derive therefrom."



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DIAMOND

Diamond production was again an all-time high

1958 was a good year for the diamond mining industry. World production of diamonds has reached an all-time record figure, for the ninth consecutive year.

Official figures for most countries are not yet available, but total production is estimated at about 28,000,000 metric carats, an increase of roughly 2 million carats, or nearly 8 percent, compared to 1957.

This increase is due to higher output in the mechanized mines of Belgian Congo, Angola, and Tanganyika.

All large diamond producing companies have a delivery contract with the Diamond Corporation Ltd., London and Johannesburg, which controls the world market for rough diamonds, maintaining stable prices, and regulating supplies according to demand.

The purchase of these companies' production being guaranteed on quota, and its sale being organized on a cooperative basis, fluctuating market conditions during the recession did not directly affect mining operations, which proceeded unhampered. Therefore there were no cut-backs in production.

No major discovery of new diamond deposits was reported during the year.

BELGIAN CONGO: This country is the world's leading producer. About 60 percent of all newly mined diamonds come from the Belgian Congo. Better than 96 percent of these are for industrial use, mostly crushing board, a product widely used in industry, as the most powerful abrasive, in grinding wheels and diamond impregnated tools.

The provisional production figure for the year is 16,673,464 carats, an increase of one million carats, or nearly 8 percent, over the previous year.

Of this total, 16 million carats were produced at the Bakwanga mines of the SOCIÉTÉ MINIERE DU BECEKA, which is the largest producer of industrial diamonds in the world. These mines are highly mechanized, and in most of them the work goes on day and night, in three shifts. An estimated 6,000,000 cubic meters of overburden and gravel were removed

mechanically during 1958. Construction of the new Central plant for the treatment of gravel and kimberlite material is proceeding according to plan, and the first half section will begin operating in the first months of the current year.

Production of the Kasai alluvial fields, operated by the FORMINIÈRE company as a single unit for the account of all concession-holders, was 669,320 carats, an increase of 38,400 carats, or 6 percent, over 1957.

Incidentally, the diamond mines are more than 1,000 kilometers distant from Léopoldville, and remained unaffected by the recent disturbances there.

SOUTH WEST AFRICA: This territory is the leading diamond producer, in value, (about £20,000,000) owing to the fine quality of its diamonds. These are predominantly gem stones, weighing on average one carat per stone. Most of these diamonds are produced by CONSOLIDATED DIAMOND MINES OF SOUTH WEST AFRICA, in the coastal Diamond Area No. 1 near Oranjemund.

In September 1958 this company won its lawsuit against the South West African Administration, which had conceded to S. W. AFRICA PROSPECTORS PTY, the mining rights on the beach strip exposed at low tide bordering the C.D.M.'s concessions. S.W.A. PROSPECTORS now intends to dredge diamonds from the sea-bottom, up to 800 yards from the low-tide mark, on a coastline length of 280 kilometers.

To the north, in Diamond Area No. 2 at Lüderitz, INDUSTRIAL DIAMONDS S.A. has also obtained a maritime concession extending three miles into the Ocean, and has announced that it intends dredging the maritime beaches, to obviate the high cost of dry-land mining. Diamonds produced in this area are small industrials.

DE BEERS CONSOLIDATED MINES has obtained three concessions in the Kaokoveld, in the far north. The largest of these mines was opened in 1957 and is operating on a small scale.

During the first 10 months of 1958, South West Africa produced 756,410 carats.

UNION OF SOUTH AFRICA: DE BEERS CONSOLIDATED MINES has been operating three of its pipe mines: Wesselsfontein and Dutoitspan at Kimberley, Cape Province, and Jagersfontein in the Orange Free State. The Bultfontein mine was on maintenance. These three mines, together with the Premier mine in Transvaal, account for the bulk of the Union's production. The remaining 15 percent are mined in the proclaimed alluvial fields by diamond diggers, and in the State Alluvial Diggings in Namaqualand. The government has recently decided to take the necessary steps to double the production of the State Diggings, now estimated at about 150,000 carats yearly.

The new central plant of De Beers at Kimberley started operating in June 1958. Its theoretical capacity is 21,000 loads

1. This is an abstract of the complete report in English on the diamond industry which is being published as *The Diamond Industry in 1957-1958* by VLAAMS ECONOMISCH VERBOND, Schoenmarkt 31 VII, Antwerp, Belgium, Price \$2.00. Mr. Moyer is author of this leading survey which includes description of Mining, Trade, Industrials, and Polishing. Copies may be obtained after publication about April 1st by writing directly to Antwerp.

per day or 440,000 tons a month.

GHANA (Gold Coast): Ghana has become the second largest world producer of diamonds, by weight, with over three million carats for each of the two last years. About 85 percent of the stones recovered are industrials.

About 1½ million carats are produced by five mining companies, the leading producer being the C.A.S.T. (CONSOLIDATED AFRICAN SELECTION TRUST) at Akwatia, accounting for about 1.2 million carats.

The remainder comes from licensed African diggings in the Tarkwa and Oda districts, where alluvial deposits are worked by primitive and wasteful methods.

During the first 11 months of 1958, the native producers sold 1,670,774 carats in the Government Diamond Market at Accra.

SIERRA LEONE: The country is still plagued by illicit diamond mining and large-scale diamond smuggling.

The SIERRA LEONE SELECTION TRUST, a subsidiary of C.A.S.T., is the only diamond mining concern in the Protectorate, producing about ½ million carats yearly. Its concessions were reduced in 1956 to 309 square miles, and diamond digging by Africans was made legal in the areas surrendered by the company. Owing to wasteful hand methods, these deposits have already been partly exhausted by the diggers, and they are now trespassing in large numbers on the company's remaining reserves.

According to a government statement of January 15th, 1959, mobs of illicit diggers make nightly raids on the Selection Trust workings, and their retreat is protected by armed gangs against the police forces. This general lawlessness in the Kono district threatens the future of the country, and imperils the indispensable revenue which the government obtains from the company in taxes, etc. Special measures are being contemplated by the government to meet the situation.

The DIAMOND CORPORATION SIERRA LEONE Ltd., a subsidiary of Dico London, bought in 1957 from the native diggers diamonds worth £5,274,296, and probably a comparable amount in 1958. The remainder of the diggers' production, both legal and illicit, is smuggled over the Liberian border.

LIBERIA: The Liberian diamond fields, after remaining closed during 15 months on government's orders, were reopened in July 1958, with the restriction that a strip of 500 feet on both sides of the Lofa River remains reserved for eventual concession to mining companies whose capital is at least 50 percent in Liberian hands.

Liberia has again exported officially in 1958 more than 750,000 carats of diamonds, mostly to Antwerp. Besides official exports, large illicit exports are reported. It is generally known that the bulk of these Liberian diamond exports consists of stones smuggled over from Sierra Leone and French Guinea. These goods become legitimate for the diamond trade by paying Liberian export duties on the value declared at the Monrovia customs, which is underestimated.

ANGOLA: The COMPANHIA DE DIAMANTES DE ANGOLA (Diamang) holds exclusive diamond mining rights. In 1958, production was up 15.8 percent to over one million carats. About 60 percent of all diamonds mined in Angola are of gem quality. The mechanization of the workings has been progressing further. Prospecting work was actively pursued and gave hopeful indications.

FRENCH EQUATORIAL AFRICA (Oubangui): The production is declining, owing to the gradual exhaustion of the alluvial deposits. Only 48,337 carats were produced during the first half-year 1958, against 60,934 carats for the corresponding period of 1957.

The leading producer, COMPAGNIE MINIERE DE L'OUBANGUI ORIENTAL, has produced only 30,856 carats for the year 1958, compared with 50,824 carats for the year 1957.

FRENCH WEST AFRICA (Guinea and Ivory Coast): The official production figure for the first half-year 1958 is 141,227 carats. However, large-scale illicit diamond mining and smuggling is going on in Guinea. The concessions of the mining companies, the SOCIETE MINIERE DE BEYLA and the SOGUEX, are being constantly plundered by large gangs of illicit diggers. The French Overseas Mining Bureau reports that tens of thousands of irregulars are ravaging the reserves in the leases of the companies, after having exhausted rapidly the large alluvial deposits which had been surrendered to them in 1957.

The Co-operative "BEKIMA" of native producers, which was supposed to channel into legal markets the diamonds found by the diggers, has proved instead to be only a blind covering smuggling activities towards Liberia, in amounts estimated to exceed ½ million carats yearly.

TANGANYIKA: Diamond exports reached the record figure of 515,762 carats valued at £4,391,647.

The new treatment plant of Williamson Diamonds Ltd. treats

between 5,000 and 6,000 tons daily, compared with 4,000 in 1957.

Following the death of Dr. Williamson in January 1958, Mr. Harry Oppenheimer, chairman of De Beers, made an arrangement with the heirs for the purchase of their shares. An agreement was signed in August 1958 between the government of Tanganyika and De Beers; they will hold each 50 percent of the shares. The total cash outlay to be made by De Beers amounts to more than £4,000,000, which was provided by Anglo-American Corporation of South Africa, in foreign exchange accruing from a debenture issue of 50,000,000 Deutsche Marks, placed on the German stock market.

BRAZIL: Only a fraction of the Brazilian diamond production is registered, and there are very few official exports, the major part of the diamonds being exported illegally. As a consequence, there are no official figures of the diamond production, which is estimated at a quarter of a million carats. There are no large diamond mining concerns; the stones are recovered manually by thousands of independent diggers called "garimpeiros" and some small groups operating obsolete equipment and mining without much method.

VENEZUELA: Diamond mining is done by about 4,000 diggers, called "mineros de libre aprovechamiento," in the areas proclaimed open by the government in the Gran Sabana. Production in 1958 is expected to be lower than in 1957 (122,598 carats) on account of the social unrest which prevailed in the diamond mining areas during the first months of the year.

BRITISH GUIANA: During the first 10 months of 1958, the Guyanese "pork-knockers" found 206,547 diamonds weighing 24,167 carats. Production for the year is estimated to be comparable to the 29,037 carats produced during 1957.

INDIA: Production declined to 790 carats in 1957, and the 1958 output is estimated to be comparable. All diamond mines were nationalized in 1956, but the government's project to introduce mechanized working of the deposits has not yet been carried into effect.

AUSTRALIA: Organized diamond production ceased in 1958 when Wellington Alluvials Ltd. ceased dredging in the Macquarie River for gold, of which the diamonds were a byproduct. U.S.S.R.: No production figures have been disclosed, but only percentages. Diamond production during the year 1958 was reported to be eight times greater than the production of 1957, which was not mentioned but is thought to have been modest, considering the preliminary stage of operations at the time. The new seven-year plan expects diamond production in 1965 to be increased up to fifteen times the 1958 output. Assuming the 1965 goal to be 7,000,000 carats, this would mean that 58,000 carats were produced in 1957 and 470,000 carats in 1958. Most stones are small industrials.

In August 1958 the COCOM lifted the ban on the export of diamonds and diamond tools to the countries of the Soviet block, and some official exports to Iron Curtain countries have already been reported.

Mine Production of Diamonds by Countries¹ in Metric Carats for 1956, 1957, and 1958²

Country	1956	1957	1958 ³
Belgian Congo	14,010,455	15,646,722	16,673,464
South Africa	2,585,728	2,578,975	2,702,250
South West Africa ..	988,653	996,965	903,575
Ghana (Gold Coast) ..	2,539,428	3,124,821	3,200,000 ²
Sierra Leone	549,091	863,202	1,490,037 ²
Liberia (Exports)	1,025,034	757,138	800,000 ²
Angola	740,035	864,371	1,001,236
Tanganyika	358,717	390,971	515,762 ³
French Equatorial			
Africa	145,840	109,200	90,000
French West Africa ..	389,700	300,000	281,000
Brazil ¹	250,000	250,000	250,000
Venezuela	93,834	122,598	100,000
British Guiana	29,816	29,036	29,000
Other countries	12,000	11,081	10,000
Totals	23,718,331	26,045,080	28,046,324

¹ Excluding the U.S.S.R. ² Estimated. ³ Exports.

It is estimated that about 82 percent of these newly mined diamonds were of industrial quality.

At £65,543,387 (£49,420,696 for gems and £16,122,691 for industrials) diamond sales made during 1958 through the Central Selling Organization on behalf of the producers were down 14.62 percent on the previous year's all-time record figure. It should, however, be taken into account that both gem and industrial diamonds were made available on the markets only in quantities corresponding to the level of demand. Sales for the December quarter (£20,246,615) were the highest for the year; diamond trade is improving, and the outlook for the diamond mining industry is encouraging.

Production, imports, and use of fluorspar in 1958 all dropped below 1959 figures. Domestic production and shipments declined only slightly, however, as shown in the table. Acid-grade shipments were maintained by Public Law 733 which called for stockpiling at \$53.00 per short ton unit. Nine of the independent flotation mills operated under this program but were forced to close when the law expired on December 31. Congress had passed an extension but it was vetoed by the President.

In December the Independent Fluorspar Producers Association filed an industry brief before the Office of Civilian and Defense Mobilization that the decline of the domestic fluorspar industry constituted a threat to the national security.

The increase in metallurgical output was due in part to stockpiling during the first six months of the year and to continuing high production from Montana for shipment to Utah steel mills.

As usual, Illinois was again the leading mine production state. Minerva Oil Company operated two mills near Cave-in-Rock, Ozark-Mahoning Company operated its central mill at Rosiclare, as did the Aluminum Corporation of America. Southern Illinois Mining Company operated for a few months at a substantial rate.

Pennsalt Chemical Company operated as Calvert City Chemical Company at Mexico, Kentucky. All ore came from its Dyers Hill mine near Burna, where shaft deepening is now underway. One prospecting drill operated in 1958. Lead and zinc byproducts are important here. Some mill enlargement is planned for 1959.

Reynolds Metals Company and DuPont were conducting prospecting programs in the Kentucky fluorspar area at year's end. Tri-State Zinc Company and New Jersey Zinc Company had drills operating on the Illinois side during 1958.

In the west, General Chemical Division of Allied Chemical Corporation operated its Jamestown, Colorado, Burlington mine and Valmont mill continuously in 1958.

In San Bernardino County, California, Pacific Fluorite Company reported a small production of acid-grade fluorspar for the GSA stockpile, as did also the J. Irving Crowell mill in Nye County, Nevada, and the Wells Cargo, Inc., operation in Lincoln County, Nevada. In the Delta, Utah area, Chesley Black, T. A. Claridge, George Spor and Sons, and the Willden Brothers, produced 14,000 tons of metallurgical fluorspar, most of it going to the GSA stockpile. None of the Arizona, New

Mexico, or Texas mines or prospects reported production during 1958 except some initial production of acid-grade fluorspar by Fluorspar and Chemical Company from its mill at Tonto Basin, Arizona.

Imports declined sharply from 631,000 tons in 1957, to approximately 350,000 tons in 1958.

The recession in the steel industry, starting in October of 1957, caught the industry with its normal winter accumulation of metallurgical fluorspar almost complete. In the closing months of 1958, when shipments to steel mills could have been made, floods and washouts in Mexico seriously damaged railroads and highways, preventing much tonnage from arriving in Brownsville. Of the 181,000 tons of metallurgical fluorspar used in 1958, the steel industry imported approximately 100,000 tons. The balance of its needs were carried over stocks.

The United States government barter contract for importing the acid-grade fluorspar from Adolpho Romo's mill at Muzquiz, Coahuila, Mexico, was reported nearly completed. Thereafter, production from this mill, with an estimated capacity of 50,000 tons per year, will seek a United States market. Recently a barter contract was completed involving 110,000 tons of acid-grade fluorspar from Sardinia and Italy.

As more properties are exposed on the surface, and more geologists complete their studies, the estimates of the huge Mexican fluorspar reserves continue to grow, district by district. There has been no deep mining of consequence yet, and very few drilling projects of any size have been completed in some of the most favorable districts.

Projecting long-term fluorspar uses, it appears that 1959 consumption should approach 650,000 tons and 1960 might reach 700,000. For 1959 there should be an increase in fluorspar use for making aluminum, a 10 percent increase in fluoro-carbon manufacturing, a growing demand for metallurgical fluorspar by the steel industry, and a slight pick up in new uses for ceramic grades.

Increasing amounts of byproduct fluorides are being recovered from phosphate for use in aluminum and certain chemical fields. Recovery of fluorides from steel slags is also under study.

With national reserves of fluorspar at an all-time high, domestic producers are seeking new uses and have made strides in water fluoridation. Their biggest job is to maintain a fair share of the growing market.

IRON

Long range developments moved ahead in Canada



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With steel production at the lowest rate in postwar years and plenty of iron ore in stockpiles, mining was cut back as much as 50 percent in many of the nation's districts in the first part of 1958. The Lake Superior district shipping season started about a month later than usual, and many mines failed to open until well into the summer. A reduced work week was the accepted pattern in many mines, with beneficiation plant schedules adjusted to the reduced mine output. As steel production picked up in the second half of 1958, ore production reacted to the improved picture and many mines went back to a normal work week. For the whole year, the American Iron Ore Association reported receipts of domestic ore and agglomerates totaling 63,825,616 gross tons, down 36 percent from 1957, while consumption dropped 29 percent. Imports of iron ore and agglomerates totaled 27,151,359 gross tons, a 20 percent decrease. Stocks from all sources on hand at furnace yards and Lake Erie docks at the end of the year totaled 65,841,574 gross tons, a slight increase over the stocks at the end of 1957 and about normal for a good business year. The iron ore industry looked for a better year in 1959 as steel needs of

100,000,000 to 115,000,000 ingot tons were forecast.

The Lake Superior ore shipping season reflected the slower activity of the Nation's steel mills that had started in the second half of 1957. According to the final figures of the American Iron Ore Association, shipments by Lake vessels amounted to 52,868,028 gross tons, a decrease of nearly 38 percent from 1957 and the lowest shipments for any season since 1939. Minnesota mines shipped an estimated 41,400,000 gross tons (not including ores containing 5 percent or more manganese), according to U. S. Bureau of Mines preliminary estimates. Taconite pellets made up 20 percent of the shipments as the State's output reached a new high of 8,500,000 gross tons. Reserve Mining Company operated at near capacity and shipped 4,900,000 tons of pellets while the Erie Mining Company in its first year of "shake-down" operations shipped over 2,500,000 tons. Oliver Iron Mining Division of United States Steel Corp. shipped nearly 1,000,000 tons. The influence of increasing amounts of pellets higher in iron than the direct shipping ores was reflected in an increase in the average iron content of the Minnesota ores from 50.65 percent in 1955 to 52.49 percent in 1957, with a higher average indicated for 1958.

Lake Erie base prices for iron ore were the same as in 1957 and remained unchanged throughout the year. The estimated average mine value of Minnesota iron ores in 1958, irrespective of grade, was \$8.10 per long ton as compared with \$8 in 1957. The increase was attributed to the higher percentage of taconite pellets.

Developments on the Minnesota ranges went ahead in spite of the cutback in production. M. A. Hanna Company con-

tinued stripping operations at the Pierce mine near Hibbing in anticipation of starting shipments in 1959. The Oliver Iron Mining Division added a heavy media section to the Hull Rust beneficiation plant and started to double the capacity of the crushing and screening facilities at the Stevens Mine.

Michigan iron mines shipped 8,150,000 gross tons, about 38 percent less than in 1957, according to U.S. Bureau of Mines preliminary estimates. However, important low grade developments went forward in spite of the recession. Development of the Groveland open pit mine and construction of the gravity-flotation plant neared completion. The Hanna Coal and Ore Corporation planned to start producing specularite concentrate early in 1959 at an initial rate of about 350,000 tons a year. Although the Humboldt mine and flotation plant were closed down most of the year, plans were announced to double the size of the plant and add a pelletizing section to give an annual capacity of 640,000 tons of pellets averaging 63 percent iron. The Cleveland Cliffs Iron Company put the Eagle Mills ore improvement plant into production in July and treated over 400,000 tons in drying, crushing, and heavy media sections by the end of the year.

Production cutbacks in the other iron ore producing districts were not as severe percentage-wise as in the Lake Superior district. Combined production of the southeastern, northeastern and western states, amounted to 14,646,296 gross tons, 27 percent less than in 1957. An important new development went forward in the Pea Ridge area of Missouri where Meramec Mining Company (a joint operation of Bethlehem Steel Company and St. Joseph Lead Company) worked full schedules in sinking a shaft to develop a large magnetite-hematite ore body discovered by airborne magnetometer surveys in 1951.

Imports of iron ore held up better percentage-wise than domestic shipments in 1958. Venezuela should be in first place for the whole year with an estimated 12,000,000 gross tons, about the same as the shipments in 1957. The American Iron Ore Association reported shipments of 8,038,575 gross tons from Canada, 31 percent less than in 1957. Over half of the decrease in imported iron ores resulted from cutbacks in Canadian shipments. Nevertheless, long range developments moved forward in Canada towards increased iron ore production. Quebec Cartier Mining Company awarded contracts for construction of a railroad, harbor, power plant, and town for the low grade iron development near Las Jeannine in Quebec Province. An 8,000,000 ton per year concentrator will be a part of this development. Canadian Javelin's development in Labrador, which had been postponed a year because of the unsettled steel industry, finally got started with the award of a contract for 42 miles of railroad. Caland Ore Company Ltd. continued hydraulic dredging in the Steep Rock Lake area. On the other hand, Loshophos Ore Company, a subsidiary of M. A. Hanna Company, announced that operations scheduled to start in 1958 at Moose Mountain, north of Sudbury, would be delayed a year because of decreased ore demand. The pace of exploration and development planning in the Quebec-Labrador iron ore fields slowed down in 1958. M. A. Hanna Company acquired control of important iron ore properties in Brazil.

A highlight of the year was an agreement between the

United States and the Soviet Union for an exchange of delegations to visit the iron and steel industries of the two countries. The U. S. delegation made up of 20 representatives of industry and government visited the iron mines and steel plants of the Soviet Union in May and June. Russian engineers and technicians toured U.S. mines and plants in September and October. Reports given by members of the U. S. delegation apprise us of the very large iron ore reserves in the U.S.S.R. and the rapid growth of the steel industry. Iron ore production in 1957 came to 82,900,000 gross tons and probably was greater in 1958; thus the U.S.S.R. for the first time lead the other countries of the world in iron ore production. Soviet Union steel production approached 60,000,000 ingot tons in 1958 compared to 85,000,000 tons in the U.S.; their production has doubled since 1950 and their plans call for 70,000,000 tons in 1960.

In this country, research and plant laboratories working on iron ore problems studied methods to provide cleaner feeds to the various plant sections by extending the range of separation to finer sizes in heavy media, cyclone, and spiral circuits. New ore beneficiation plants showed increased usage of instrumentation and automation to achieve better control. Experimental work was under way in Minnesota to improve the grade of taconite concentrates to something in the range of 66 percent iron and 5 percent silica. Treatment of the taconite middlings by flotation also was under study. Increased interest in the nonmagnetic taconites was evidenced by a long range program starting with a field investigation of the character of this resource. Studies of Michigan nonmagnetic jaspilites were concerned with magnetizing roasting, new flotation techniques for very fine grained minerals, and direct reduction of the iron oxides. Interest picked up in the applications of high intensity magnetic separation and high tension separation to iron minerals. Various direct reduction processes announced in the past year or so were tested, largely on commercial grades of ore. There was increasing interest in self-fluxing sinter. By adding limestone to the sintering charge, part of the work of converting the ore to iron is accomplished in the sintering machine with the result that greater yields are realized from the blast furnace.

In spite of the slump, 1958 was a year of noteworthy events and trends. The St. Lawrence Seaway was opened to ships of 14-foot draft; as the Seaway comes into full use in 1959, we may see a greater market penetration by foreign ores and agglomerates. Domestic ore production was cut back more percentage-wise than were imports, but production of pellets held up well. Development programs and expansion of present facilities went ahead in spite of the recession, both in this country and in Canada. Although steel plants operated at about 54 percent capacity for the whole year, capacity was increased to a new high of 147,000,000 ingot tons per year. For the first time in postwar years, we were permitted a look at the Soviet steel industry and iron ore resources. The amazing progress that has been achieved in a relatively short period augurs that Russian steel will appear in world markets in increasing amounts in the next few years and perhaps become a strong wedge in economic penetrations of underdeveloped countries for political objectives.

LEAD

Excess imports cut price and production



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Bunker Hill Company
San Francisco, California

In general, 1958 was a year of disappointment for domestic lead producers. In spite of suspended government stockpile purchases and a 14 percent decline in lead consumption, excessive foreign imports continued unabated (until the October 1 imposition of quota restrictions), forcing the year-beginning 13¢ New York quotation to an August 13 per-quota low of 10.75¢. Domestic mine production curtailments accompanying a 1958 average pricing of 12.11¢ for lead dropped U.S. mine production to its lowest level in 60 years.

In late 1957 the Emergency Lead-Zinc Committee representing virtually all of the domestic producers petitioned the Tariff Commission for relief for both lead and zinc as provided in the Escape Clause of the Reciprocal Trade Agreements Act. In mid-1958 the Commission unanimously reported injury and recommended an increase in the tariff for both metals. In addition, half of the Commission also recommended import quotas. The Administration, however, concerned with our relations with other metal-producing countries, presented as an alternative the Minerals Subsidy Bill to Congress. This plan, if accepted, would have provided a support price of 14.75¢ per pound of domestically mined lead, up to a maximum of 350,000 tons annually.

Although passed by the U.S. Senate in July, the Administration's Mineral Subsidy Bill was defeated in the House August 22. On September 22 quota restrictions on lead and zinc im-

ports were announced by Presidential Proclamation. Under this plan imports of lead and zinc are restricted to 80 percent of the average commercial imports for the five-year period, 1953 through 1957. Table No. I carries this detail concerning lead.

A temporary buying surge followed the quota announcement. However, by year-end the market was quite inactive and the 13¢ pricing was considered weak.

LEAD CONSUMPTION: While 1958 world lead consumption, exclusive of the U.S., held at the 1957 level, U. S. consumption declined to 980,000 tons as compared to 1,138,115 tons in 1957. This decline, as indicated by the "end usage" breakdown of Table No. II, is generally expressive of prevailing domestic industry-wide 1958 recession conditions. However, exaggerated losses in the battery and cable industries are to be noted. In the case of the battery industry, recent engineering developments have resulted in improved automotive units capable of a four to six months greater service life than provided only a few years ago. In the cable sheathing industry lead has been particularly vulnerable to the inroads of substitute materials and a progressive decline in tonnage demand has been recorded over a period of several years.

In reviewing the depressed 1958 market conditions, the historic growth pattern from 1953 to 1957 in lead consumption should not be overlooked: United States; 4 percent gain over period, 1948 to 1952. Other gains are, Europe (per capita consumption), 41 percent; elsewhere (still below that of U.S.), 31 percent; and average free world, 21 percent.

Also to be held in mind is the future potential of a greatly activated and expanded Lead Industries Association-American Zinc Institute research program. In this respect extensive research programs aimed toward the development of new and improved lead products have been instigated in the alloy, ceramic, and chemical fields. Completed in 1958, as a part of this expanded effort, was a cooperative Lead Industries Association-John F. Robertson Co. program for the testing of a new device for the continuous casting of alloy cable sheathing. This equipment eliminates many of the restrictive features of the intermittent extrusion process and should enhance the com-

petitive position of lead alloy sheathed cable.

SUMMARY AND COMMENTS: Excessive imports and reduced consumption combined with market reactions in anticipation of and resulting from Administrative measures accounted for the eleven price fluctuations. During 1958, the U.S./L.M.E. price differential exceeded the prevailing low level of tariff protection and foreign surplus production continued to flow into U.S. markets. With the suspension of the government stockpiling program, the burden of such surplus stocks fell upon U.S. domestic producers.

Stocks of refined lead held by domestic producers increased to 252,466 tons by the end of 1958, which is 149,158 tons more than 1957. At the same time refined lead held by foreign producers stood at 81,999 tons, or 3,700 tons less than in 1957.

As the new year gets under way the lead market continues to be depressed. So far in 1959 the price has dropped from 13¢ to 11¢ and this reduction has not encouraged increased sales, at least as far as the domestic producers are concerned.

While the September 22 Presidential Proclamation establishing lead and zinc quotas was generally accepted as a step toward the eventual solution of domestic lead-zinc problems, certain inherent weaknesses, which prevent the maintenance of adequate domestic prices in the face of continued World Surplus production, are quite apparent. For example, prevailing low duty rates permit importers, via discounts, "first call" access to our domestic markets for both "under quota" unmanufactured items and for numerous "ex quota" semi and manufactured items. Both industry and the government are well aware of these shortcomings and are currently engaged in cooperative studies aimed toward an equitable resolution.

The consumer price index based on years 1947 to 1949 stood at 119.2 in 1958. It is interesting to note that if lead, which averaged 16¢ in that 1947-1949 period, had followed the average consumer price index trend, it would be selling today for 19¢ a pound. Instead, it is quoted currently at 11¢ and the domestic lead producers have at the same time been subject to equivalent increases in operating costs, etc., as have those in other industries.

TABLE NO. I

Country	Lead Metal Imports			% Change Due to Quotas
	Avg. Qtrly. Comm'l Imports 1953-57 incl.	Qtrly. Quota	Avg. Quarterly Imports, 1957	
Mexico	23,050	18,440	21,300	-13.4%
Australia	14,800	11,840	18,317	-35.4%
Canada	9,950	7,960	7,152	+11.3%
Yugoslavia	9,850	7,880	8,137	-3.2%
Peru	8,050	6,440	8,625	-25.3%
Other	3,800	3,040	3,247	-6.4%
	69,500	55,600	66,778	-17.0%
Country	Lead Ore Imports			% Change Due to Quotas
	Avg. Qtrly. Comm'l Imports 1953-57 incl.	Qtrly. Quota	Avg. Quarterly Imports, 1957	
Peru	10,100	8,080	13,863	-42.0%
South Africa	9,300	7,440	10,979	-32.2%
Canada	8,400	6,720	6,298	+7.0%
Australia	6,300	5,040	9,249	-46.0%
Bolivia	3,150	2,520	4,580	-45.0%
Other	4,100	3,280	4,489	-27.0%
	41,350	33,080	49,458	-33.1%

TABLE NO. II
Lead "Balance Sheet" in Tons of Metal

Consumption by Industries		1957	1958
Storage batteries	361,015	302,913	
Tetraethyl lead	177,001	159,888	
Cable covering	108,225	74,564	
Construction	117,847	113,159	
Pigments	115,361	93,029	
Solder	70,684	57,423	
Ammunition	42,509	40,295	
All other	145,473	138,729	
Consumption	1,138,115	980,000	
Supply			
Mine production	338,216	266,000	
Secondary	489,229	425,000	
Imported ores	197,831	182,088	
Metal Imports	333,526	349,406	
	1,358,802	1,222,494	
Less exports	5,245	2,500	
Surplus	215,442	239,994	

LITHIUM

LITHIUM—There was an over supply of lithium minerals and chemicals in 1958. The Atomic Energy Commission announced that it would need no additional lithium hydroxide monohydrate to extract the lithium 6 isotope. The three largest United States lithium producers—American Potash and Chemical Company, Foote Mineral Company, and Lithium Corporation of America—all had important AEC contracts. Domestic production centers at Seales Lake, California (lithium carbonate), at Kings Mountain, North Carolina, and the Black Hills, South Dakota (spodumene). Canadian activity declined. Southern Rhodesia

produced and shipped both nicrolite and lepidolite.

The most glamorous use appears to be as lithium deuteride in the hydrogen bomb; however, grease and ceramics continued to be the most important users. About 250,000,000 annual pounds of lithium based greases are used by automobiles.

Imports will grow. Brazilian imports will increase as Orquima, S. A. of Sao Paulo will ship up to 300 tons of amblygonite per year. Southern Rhodesia has well developed mines which operated well below capacity in 1958, and Canada has developed mines with only small markets.

MAGNESIUM

MAGNESIUM—Production of primary magnesium was down in 1958, both in the United States and on a world-wide basis. United States output totaled 30,400 tons, a decrease of 63 percent below the 81,263 tons produced in 1957. World production of magnesium metal dropped from 156,000 tons in 1957 to 101,000 in 1958.

Dow Chemical Company acquired the government-owned plant at Velasco, Texas, and closed it in March 1958. For the remainder of the year, only Dow's electrolytic plant at Freeport, Texas and the government-owned silicothermic plant at Canaan, Connecticut produced primary magnesium, although Titanium Metals Corporation of America recycled magnesium as an inter-

grated operation in its titanium production at Henderson, Nevada.

Late in the year, Alabama Metallurgical Corporation began construction of a plant to produce magnesium from dolomite at Selma, Alabama. An initial capacity of 7,000 tons per year is planned. This is the first primary magnesium plant to be built with private funds since World War II.



By J. Eldon Gilbert
General Manager
Cordero Mining Company
Palo Alto, California

The end of 1958 saw the withdrawal of the United States government from the domestic mercury purchase program and the return of the quicksilver mining industry to its traditional position of vulnerability.

During the past 4½ years, for the first time in the history of the quicksilver mining industry, the mercury miners had an industry-wide floor price for their production. During this period the United States government, through the General Services Administration, purchased 24,300 flasks at a price of \$225.00 each, delivered at GSA depots.

When the GSA program was first announced, many people outside the industry, and some within the industry, believed it was the forerunner of a period of great demand for quicksilver. Many new properties were opened up and some of them were put into production. However, as these operations faced the

The Carborundum Company of Niagara Falls, New York has been experimenting with electrically fused magnesium oxide on ceramic materials. It now appears possible that large polycrystalline ductile magnesia shapes can be fabricated. If so, ceramics could be used as substitutes for metals in many applications involving extremely high temperatures or other severe conditions.

Mercury

Government agencies buy and trade in mercury

grim facts of financial life, many of them were forced to curtail or shut down entirely so that, when the government purchase program terminated December 31, 1958, the mines which looked like they might continue production, providing the price stayed near \$225.00 per flask, were mostly the old mines which had been producers for some time.

New Idria, New Idria Mining and Chemical Company, San Benito County, California, is reported to have developed some additional ore which will make production problems somewhat easier than they have been during the past.

Cordero mine, Cordero Mining Company, Humboldt County, Nevada, is continuing to operate on ore previously developed. There will undoubtedly be some reduction in production from 1958.

Sonoma mine (Mt. Jackson), Sonoma County, California, has had considerable success in developing ore during the past year and has had a good year of production. It remains to be seen if they continue exploration and development or if they merely operate from the ore already developed in order to hold cost to a minimum.

Red Devil mine, De Coursey Mountain Mining Company, Inc., Alaska, had a year during which exploration and geological work gave the management a better understanding of the geology of the mine. Production has been fair and production will probably continue at about the 1958 rate through 1959.

All of the other domestic mines will probably find it necessary to reduce their exploratory work and, hence, as each uses up its developed ore it will reduce production to match reduced rate of exploration, or shut down entirely.

While domestic production in 1957 was about 35,000 flasks and rose to about 37,000 flasks in 1958, it will definitely start down in 1959 and will probably be in the order of 32,000 flasks for the year.

Domestic consumption figures are difficult to obtain and are of little meaning in trying to analyze the supply and demand situation. This is because one of the large factors concerning acquiring and use of mercury in the United States is the fact that agencies of the United States government are buying or trading in the metal. It is believed by many that the Atomic Energy Commission is still acquiring mercury, but whether for current use or for future use is not known. Also, there are reports of government trading surplus agricultural stock for European metal.

Reports from Italy are that they are caught in the spiral of increasing prices to such an extent that they are not willing to sell at less than \$240.00, New York. It is also reported that large unsold stocks are accumulating in Italy which may total as much as 40,000 flasks.

Spain probably produced about 50,000 flasks during 1958, most of which probably went to Europe, some to the Middle East, and some to Asia. Two new furnaces are in the process of manufacture and should be erected in time to contribute somewhat to production in 1959.

Mexican operators continued to operate throughout 1958, however, at a rate somewhat reduced from 1957 when they produced over 21,000 flasks. Although they were eligible to sell to the GSA, because of problems in acquiring acceptable flasks and problems of U. S. government red tape, practically no mercury was sold to GSA. Mexican mercury was sold to U. S. consumers and also sold to consumers in Europe.

During 1958 the United States Tariff Commission made an investigation of the domestic mercury industry. The investigation was made in a straightforward, vigorous manner and the report is one of the best collections of facts and information which has ever been published.

While this report, as well as testimony by domestic mercury producers before the Tariff Commission, revealed the American mines as high cost operations with low grade ore, and with a very precarious future, no adequate measures have been taken to date by the Commission to help protect the industry from foreign importations.

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ANTIMONY—Domestic mine production of antimony in 1958 was only 877 tons, 709 in 1957. Smelter production which is from the antimony and antimonial lead content of foreign and domestic ores and concentrates was 9,250 tons against 11,400 in 1957. Imports were 8,657 versus 14,848. Consumption was 10,650 tons and 12,389 in 1957. Thus, once again, the domestic mine plus smelter production was sufficient for demand; imports were in excess of any needs and were surplus over the market.

Uses followed industrial activity in battery grids, anti-friction bearing, cable sheathings, type metal, flameproofing of chemicals paints, etc., and pyrotechnics.

Ore and concentrates were imported from Mexico, Bolivia, and the Union of South Africa. Antimony metal came from Yugoslavia, the United Kingdom, and Belgium-Luxembourg.

BISMUTH—Bismuth output, largely a byproduct of lead smelting, and consumption in the United States declined in 1958. Consumption at about 1,125,000 pounds was used in fusible alloys, pharmaceuticals, and other alloys in that order. This was a shift from 1957 consumption where the largest use was other than as fusible alloys.

Imports followed an historical pattern with Peru and Mexico supplying almost 90 percent of 650,000 pounds imported. Cerro de Pasco Corporation continued to be a leading world producer at its Peruvian mines and smelters.

CADMIUM—Cadmium production, use, and imports followed the lead and zinc mining and business cycles in 1958. Domestic supply of primary and secondary metal was about 91,100,000 pounds. Imports, about 1,950,000 pounds (all forms), and uses, about 7,600,000 pounds, meant that for the third straight year supply was far over consumption.

Electroplating continued as the largest use, but several new uses, such as, in nuclear reactors, batteries, and stabilizers in vinyl plastic, all have growth potential. The Air Force reported a cadmium sulphide electric generator had been perfected to produce eight volts of electricity when exposed to sunlight. A cadmium compound offers promise as a catalyst in manufacturing tetraethyl lead, reported the Ethyl Corporation.

COLUMBIUM-TANTALUM—Domestic production of columbium-tantalum mineral concentrates increased slightly in 1958 to an estimated 400,000 pounds. Output in 1957 had been 370,483 pounds. For the third consecutive year, Porter Bros. Corporation produced most of the concentrate at its property in Bear Valley, Idaho. The firm shipped both euxenite and columbite concentrates.

During the first eight months of 1958, the U.S. imported about three percent more columbium and tantalum concentrates than in the same period of 1958. Columbium imports in the first eight months of 1958 totaled 1,938,707 pounds, as compared with 3,348,706 pounds for the full 12 months of 1957. Tantalum imports in the eight-month period of 1958 totaled 873,141 pounds, compared with 828,265 pounds in the full year of 1957. The tantalum increase more than offset the decline in columbium imports. Largest suppliers in 1958 (eight months) were Malaya which shipped 575,467 pounds of columbium; Belgian Congo which sent 401,805 pounds of columbium and 411,017 pounds of tantalum; and Nigeria which shipped 344,750 pounds of columbium and 13,352 pounds of tantalum.

Domestic production of columbium metal tripled in 1958 (based on estimated figures) and tantalum production increased moderately. National Research Corporation began production of tantalum metal at Cambridge, Mass. Fansteel Metallurgical Corporation's \$6,500,000 columbium-tantalum plant at Muskogee, Oklahoma reached full production. Wah Chang Corporation made steady shipments from its plant at Albany, Oregon.

In addition, U.S. Industrial Chemicals Inc. undertook pilot plant production of both metals at its Ashtabula and Cincinnati, Ohio operations; Electro Metallurgical Company produced columbium on an experimental basis; and Temescal Metallurgical Corporation, sponsored by Stauffer Chemical Co., Mallory Sharon Metals Corp., and Temescal Inc., is building a \$300,000 semiproduction plant at Richmond, California to gain additional information before undertaking full-scale production of columbium and tantalum by a new method of electron beam refining.

GERMANIUM—Consumption of germanium in the United States last year has been estimated at 70,000 pounds in metal form and as dioxide used in the manufacture of semiconductor devices. About 45,000,000,000 of these germanium semiconductor devices were manufactured during 1958, indicating the popularity of this metal in a few short years since the first germanium transistor was made by Bell Telephone Laboratories in June 1948.

The amount of germanium produced in the United States is not available. Domestic sources continue to be the zinc smelters and refineries which recover germanium as a byproduct. Although there was curtailment of zinc output in 1958, this does not seem to have affected germanium production. The three domestic producers were American Zinc Company of Illinois at Fairmont City, Illinois; Eagle-Picher Company at Henryetta, Oklahoma; and Sylvania Electric Products Inc. at Towanda, Pennsylvania. Major foreign producers continued to be the Tsumeb mine of Tsumeb Corporation in South West Africa which produces a germanium concentrate, and the Prince Leopold mine of Union Minière du Haut Katanga in the Belgian Congo which recovers it as a chemical concentrate from flue dust at the Kolwezi smelter. The Olen plant of Societe Generale Metallurgique de Hoboken produced the germanium metal and dioxide from these two mines.

PERLITE-PUMICE—There was little change in the domestic perlite situation during the past year. An estimated 373,320 short tons were produced in 1958, compared with 422,346 short tons in 1957. As in the past few years, New Mexico produced most of the crude perlite mined in the U.S. Preliminary returns indicate that total crude perlite sold or used increased about 1 percent in 1958 over 1957, rising from 301,605 in 1957 to 305,000 short tons in 1958.

California led the nation in production of pumice, and continued to have the largest number of pumice operations of any state. Total amount of pumice produced in 1958 was 1,700,000 short tons, or a decrease of about 7 percent over the previous year.

Expanded perlite continued to be the largest used aggregate in plaster; other building uses continued to use about 85 percent of production. Pumice was also used almost exclusively by the building industry as block and concrete aggregate.

RARE EARTHS AND THORIUM—Mine shipments of domestic rare-earth element ores and concentrates in 1958 totaled about 1,000 short tons containing an estimated 625 tons of rare-earth oxides. This was a drop of about 55 percent below 1957 and is attributed in part to the decline in demand for ilmenite and rutile which caused a reduction in byproduct monazite output. South Carolina and Idaho produced the domestic monazite; Idaho also produced euxenite; Colorado produced thorite; and The Molybdenum Corporation of America continued to mine bastnaesite at Mountain Pass, California.

The Union of South Africa continued to be the principal supplier of monazite concentrates for the United States.

Processors of rare-earth concentrates were Davison Chemical Company, Heavy Minerals Company, Lindsay Chemical Division of American Potash and Chemical Corporation, Michigan Chemical Company, Molybdenum Corporation of America, Mallinckrodt Chemical Works, St. Eloi Corporation, and Union Chemical and Materials Corporation.

Misch metal was produced by Cerium Metals Corporation, New Process Metals Inc., General Cerium Corporation, American Metallurgical Products Company, as well as Mallinckrodt.

Firms producing refined thorium products during the year included Lindsay Division, Heavy Minerals, and Davison Chemical Division of W. R. Grace & Company. Those engaged in manufacturing finished thorium products and alloys included Dow Chemical Company, Davison, Nuclear Materials and Equipment Corporation, M & C Nuclear Inc., and Westinghouse Electric Corporation's Lamo Division.

The outlook for thorium in alloy applications, for gas mantles, and possibly for nuclear energy appears promising.

SELENIUM—A balanced supply and demand pattern characterized the selenium industry in 1958 after a decade first of scarcity and then of overproduction. Major use of selenium is in rectifiers and here it has lost ground to germanium and silicon, resulting in a sharp drop in consumption in 1957, which brought about a decrease in production in 1958.

Production of selenium actually decreased 37 percent, from 1,077,000 pounds in 1957 to an estimated 682,000 pounds in 1958. Producers' shipments were estimated at 734,000 pounds in 1958, compared with 624,500 pounds in 1957, or an increase of 18 percent. Producers' stocks dropped 82,000 pounds to about 569,000 pounds by the end of the year. Imports totalled an estimated 166,000 pounds, compared with 147,400 in 1957.

Companies producing and shipping during the year were Allied Chemical Corporation at Marcus Hook, Pennsylvania; American Metal-Climax, Inc., at Carteret, New Jersey; American Smelting and Refining Company at Baltimore, Maryland; International Smelting & Refining Company at Perth Amboy, New Jersey; Kaweck Chemical Company at Boyertown, Pennsylvania; and Kennecott Copper Corporation at Garfield, Utah.

MANGANESE—Manganese highlights in 1958 were the decline in use which paralleled the lower steel output, the termination of the government's low-grade purchase program as the Butte, Montana depot's quota was filled in May, the continuance of domestic production and shipment under the government's carlot program, and the decline in imports.

It is anticipated that the carlot program will be filled late in 1959 which will close most domestic producers. Nevada, Montana, Arizona, Tennessee, and California were important producing states in 1958 as domestic production was about 320,000 tons versus 366,000 in 1957.

India continued to be the largest supplier of foreign ore, despite centralized ore sales and the imposition of a quota

system of control over individual mines. Brazil was in second place as the important Amapa mines of Industria e Comércio de Minérios, S. A. (Bethlehem Steel Corporation) reached full capacity.

Early in 1959, the Union Carbide Corporation purchased the 297,000-ton, low-grade Mexican ore stockpile at El Paso, Texas from the federal government.

Those mines in the United States that can ungrade to carlot specifications will have a good year in 1959, but their future is uncertain. Foreign ore will find a larger market here as the government continues to encourage barter of agricultural products for manganese, and the steel industry is predicted to have a much higher operating rate.

MOLYBDENUM

Research centers on metallic molybdenum



By George O. Argall, Jr.
Editor

Once again, the United States was the World's leading producer of molybdenum, thanks to the production of the Climax mine of American Metal Climax, Inc. in 1958. However, the cut back in steel production (and Molybdenum use for alloying in the United States, a 84-day strike at Climax, and a reduced work week at many copper mines where molybdenum is a byproduct resulted in the lowest domestic production of molybdenum since 1951. Percentagewise, the United States production dropped from 91 percent of total world output to 86 in 1958 as foreign output was on about same level as 1958. Chile, the world's second largest producer, stepped up output from 3,100,000 to 4,000,000 pounds largely due to first output from the new byproduct plant of Chile Exploration Company at Chuquicamata (Anaconda Company). Braden Copper Company (Kennecott) continued regular byproduct production.

Mine tonnage at Climax varied directly with sales during the year. A five-day work week was started on March 31. Production through June was kept at a low level. Then, on July 21, the strike stopped all production, however, sales picked up late in the year and tonnage was well above target during November and December.

Climax continued regular shipments out of stock during the strike. Sinking of a new internal winze to a depth of 600 feet below the Storke Level was started. This is an 18.5-foot-diameter, concrete-lined shaft. In March the new byproduct plant to recover tungsten, tin, and pyrite from the 34,000 daily tons of molybdenite tailing was opened. The new tailing pond near Kokomo, with a final designed capacity of 320,000,000 tons, was finished during the year.

Kennecott Copper Corporation was world's second largest producer with 11,813 tons of concentrates from its Utah Copper Division, Nevada Mines Division, Chino Mines Division, and Braden Copper Company. A new pilot plant for molybdenite recovery at Nevada Mines was in operation at year's end with results so satisfactory that it appeared that increased recovery of a higher grade concentrate was possible. A new reagent, increased flotation time, and a different flotation machine were used.

Phelps Dodge Corporation's Morenci mine produced 725 tons of concentrate, down from 840 in 1957, due largely to reduced copper tonnage milled.

San Manuel Copper Corporation's byproduct output was 1,872,450 pounds of molybdenum sulphide from 11,486,300 tons of ore milled; 1,452,080 in 1957 from 8,825,130 tons in 1957. The corporation reported that, "Molybdenum production continues to be substantially less than originally estimated." Inspiration Consolidated Copper Company produced its first molybdenite from its new byproduct flotation section. Output for

the year was 114,721 pounds. This brought to six the number of Arizona byproduct producers. They are: Silver Bell of American Smelting and Refining Company, Bagdad Copper Company, Miami Copper Company, Morenci, San Manuel, and Inspiration.

Other byproduct copper producers were Utah Copper Division, Chino Mines Division, and Nevada Mines Division of Kennecott. Union Carbide Nuclear Company produced byproduct molybdenite from its Pine Creek, California tungsten-copper mine.

Two Canadian companies produced molybdenum in 1958. However, only the Molybdenite Corporation of Canada Limited was important as molybdc oxide output was 849,900 pounds (780,000 pounds molybdenum). A large portion of this was exported to Europe. The firm placed its new molybdenum disulphide lubricant plant at the mine in operation during the year. The second producer was International Ranwick Limited which produced a small amount of copper-molybdenum concentrate before flotation difficulties forced closing of its mill in August.

Mine Production of Molybdenum in Pounds by Countries For 1954, 1955, 1956, 1957, and 1958

Country	1954	1955	1956	1957	1958
Canada	452,000	774,000	871,000	783,739	566,600
Chile	2,663,000	2,817,000	3,121,000	3,100,000	4,000,000
Japan	450,000	439,000	534,000	594,000	668,000
Republic of Korea	22,000	24,000	31,000	34,000	86,000
Mexico	159,000	55,000	33,000	40,000*	35,000*
Norway	335,000	379,000	366,000	365,000	331,000
United States	58,668,000	61,781,000	57,462,000	60,733,000	40,600,000*
Yugoslavia	441,000	948,000	800,000*	462,000*	500,000*
Others	710,000	683,000	982,000	400,000*	400,000*
Total	63,900,000	67,900,000	63,200,000	66,613,000	47,186,600

*Estimated.

Canadian exploration continued to be very active. Central Metal Mines Limited found molybdenite by drilling in north-western Quebec. Canol Metal Mines Limited prospected and sampled its prospect in the Yukon Territory. Preissac Molybdenite Mines Limited, in which Molybdenite Corporation of Canada holds a large interest, continued exploration and development of its property northwest of Val d'Or, Quebec and only 20 miles from Molybdenite Canada's mill. Reserves reached 1,250,000 tons. Along the LaCorne batholith margin where Molybdenite Corporation's mine is located, Steeloy Mining Corporation resumed exploration of its prospect which it originally staked and prospected in 1943 and 1944. Lindsay Explorations Limited planned to bulk sample its prospect north of Port Arthur, Ontario, Diamond drilling was carried out by Nortoba Mines Limited at its gold-molybdenum prospect. Good mineralization over narrow widths was found in drill cores. Burrex Mines Limited optioned a discovery in Quebec where a stock work and the veins cutting it showed molybdenite. Billiton Company (Dutch) trenched and sampled a large outcrop showing wide widths and long lengths of mineralization on its op-

tioned Peters-Quilty prospect in northern Ontario.

The Russians are reported to have developed a new molybdenum mine at Kajaran, high in the Zangezur Mountains of Armenia.

Much research work continued on methods to produce, and cast metallic molybdenum. Climax built a new \$1,000,000 plant

at Coldwater, Michigan to produce un-alloyed molybdenum metal and high temperature alloys. Two vacuum arc consumable electrode furnaces were installed. Vapor deposited molybdenum coating techniques were improved so as to offer new applications and advantages for molybdenum's corrosion resistance and high temperature strength.



By Dr. John F. Thompson

**Chairman of the Board
The International Nickel
Company of Canada,
Limited
Copper Cliff, Ontario,
Canada**

NICKEL

Nickel faces an era of vigorous competition

The year 1958 was marked by dramatic changes in the nickel industry, highlighted by abundant supplies of nickel throughout the free world for both civilian and military purposes as well as by vigorous competition for new markets.

The Free World attained a new high in annual nickel production capacity in 1958, estimated at about 525,000,000 pounds—almost double the capacity existing prior to the Korean conflict. Total nickel consumption was between 325,000,000 and 335,000,000 pounds, compared with about 415,000,000 pounds in the previous year. The principal cause of the decrease was the business recession in the United States and Canada which had a particularly strong effect upon the production of durable goods.

Canadian production during 1958 declined sharply, largely as a result of a strike which began in September at International Nickel's mines and plants in Ontario. Prior to this, due to reduced demand, the company had announced three curtailments in production which ultimately lowered its output to an annual rate of approximately 200,000,000 pounds, or about two-thirds of capacity. Cuban production was also reduced as a result of lower demand and internal disorders.

Today's Free World annual nickel production capacity of approximately 525,000,000 pounds is expected to rise progressively in the next few years to about 550,000,000 pounds in 1959, about 600,000,000 pounds in 1960, and about 650,000,000 pounds in 1961. It is significant that the projected 1961 nickel production capacity will be about double the estimated total free world consumption in 1958.

International Nickel's Thompson mine in Manitoba, Canada has been under development for two years. This mine is scheduled to start its breaking-in period some time in the latter half of 1960. Full production at the annual rate of 75,000,000 pounds will be reached as soon as possible after the end of the breaking-in period. At this rate, International Nickel's production capacity at its operations in Ontario and Manitoba will

total 385,000,000 pounds per year. The Manitoba project will be the world's second largest source of nickel, exceeded only by the company's operations in the Sudbury District of Ontario which have an annual nickel production capacity of 310,000,000 pounds.

The Free World's total potential output in 1961 also includes from Canada that of Falconbridge Nickel Mines Limited and Sherritt Gordon Mines Limited. As a result of expansion programs in which these companies have been engaged, their respective capacities will reportedly amount to 55,000,000 and 27,500,000 pounds per year. It has been reported that the capacity of the United States Government-owned plant at Nicaro, Cuba, will be 54,000,000 pounds annually, and Freeport Sulphur Company has announced it will produce 50,000,000 pounds of nickel annually from its deposits at Moa Bay, Cuba. The capacity of producers in the United States is estimated at some 20,000,000 pounds of nickel annually, originating largely from the M. A. Hanna Company's deposit at Riddle, Oregon. According to published statements the French nickel company, Societe Le Nickel, with mines on the island of New Caledonia, contemplates increasing its nickel output to some 50,000,000 pounds per year. In addition, there will be a relatively small output of nickel in Japan, which is also produced from New Caledonia ores.

The greater availability of nickel during 1958 brought with it changes in applications, some new and others a restoration of older uses which had been in effect prior to the period of restricted civilian supplies. Free world nickel consumption is estimated as follows: stainless steels, 28 percent; engineering alloy steels, 16 percent; nickel specialty alloys, 16 percent; foundry products, 15 percent; electroplating, 14 percent; copper and aluminum base alloys, 6 percent; and miscellaneous, 5 percent. These figures show that the steel industries continued to be the largest consumers of nickel.

The nickel industry is entering a period of vigorous competition. During the past period of nickel shortage, producers of competitive materials have naturally taken advantage of the fact that large quantities of nickel were required for defence production and were also put into government stockpile. As a result substantial inroads were made into traditional civilian markets for nickel. Now that nickel supplies are plentiful, both for defence and civilian purposes, the nickel industry must recapture these markets and create new uses for nickel-containing products.

POTASH

The eyes of the potash mining industry turned to Saskatchewan, Canada in 1958. With reserves estimated at 6,000,000,000 tons in relatively flat dipping beds 5 to 10 feet thick averaging 25 percent K₂O or more, there was good reason for this interest. However, the beds are deep, over 3,000 feet, and are overlaid by beds of quicksand, natural gas-bearing sediments, and water-bearing sediments so that mine development is slow and costly. However, Potash Company of America, Ltd. proved that shafting was possible, sinking inside a frozen cylinder, and that the ore could be mined with no ground support problems. First ore was milled in December at the new mill at Saskatoon.

International Minerals and Chemical Corporation virtually completed its mill at Esterhazy at year's end but water-bearing formations drastically slowed shaft sinking. At year's end, negotiations were well under way by a third Carlsbad, New Mexico producer—United States Potash Division of United States Borax and Chemical Company—to build a mill and sink a shaft on its leases. Continental Potash Corporation continued shaft sinking near Unity. Duval Sulphur and Potash Company holds

several large leases in Saskatchewan. American Metal-Climax, Inc., which owns Southwest Potash Corporation at Carlsbad, was exploration drilling during the year on its leases. Other United States, Canadian, French, and West German interests hold leases in the Province.

Shifting of the world's potash center from Carlsbad to Canada is because the ore is higher grade, there are income and other tax benefits, and a large market is available without excess freight costs.

Carlsbad will continue to be a most important potash producer in the years ahead. While new mine expansion has slowed, the six established producers: International Chemical and Minerals Corporation, Potash Company of America, Southwest Potash Company, Duval Sulphur and Potash Company, United States Potash Company, and National Potash Company, all made important technological advances and added new mine and mill equipment to achieve lower costs. Lower costs and higher output must be maintained in order for the mines to operate because prices were cut for the second year in a row to 1942 level in an effort to increase sales. Under contracts, no

price increases are possible until July 1960.

United States mine production was below the preceding year for the first time since 1949—2,190,000 tons of K_2O versus 2,270,000 in 1957. However, sales were up 4.0 percent to 2,280,000 tons. Imports from West Germany, Spain, France, Russia, and East Germany supplied about 10 percent of market.

Domestic marketing will be changed as the Central Farmers Fertilizer Company bought into National Potash Company and



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In this review rock will mean both phosphate ore used direct and phosphate concentrates produced by beneficiation plants.

World production of rock for 1958 was about 32,500,000 long tons—up perhaps 1,500,000 tons from 1957. About a quarter of this increase is from the United States. Abroad, there was increased activity in North and South Africa, Togo, Israel, Trans-Jordan, China, and Russia. There will be a continued world-wide growth of the industry.

Domestic production at about 15,300,000 long tons was a few hundred thousand tons over 1957. Most of the increase is accounted for in the western field as production from Florida and Tennessee remained close to 1957. Increased tonnage for 1958 continues to reflect the growth rate of recent years of about 3 percent per year.

The three producing fields were: Florida, 10,900,000; Western, 2,450,000; and Tennessee, 2,000,000. Interest in the new North Carolina field in Beaufort County was at a minimum and less than in 1957.

FLORIDA: There are eight operators in the pebble field (east of Tampa) and one in the hard rock field (100 miles to north). The pebble field accounted for over 98 percent of Florida production.

The trend toward use of lower grade rock 68 percent BPL, continues in the manufacture of triple superphosphate fertilizer. This effects the rock producers.

American Agricultural Chemical Company operated its Boyette and South Pierce mines. A new 20-yard dragline was installed at South Pierce. At the Boyette flotation plant tables were replaced by a belt separator for treating coarse flotation material. Some additional reserves were acquired.

American Cyanamid operated the Sidney and Orange Park mines and acquired new reserves. A new dryer was installed at the Brewster plant.

Armour Fertilizer Works operated its Bartow mine.

Coronet Phosphate Company, a division of Smith-Douglass Company, operated the Tenoroc mine.

Davison Chemical Company, a division of W. R. Grace & Company, operated the Pauway and Bonnie mines. They acquired additional reserves. A new dryer was added.

Swift & Company operated the Watson and Varn mines. A new 14-yard dragline replaced a smaller unit at Watson.

International Minerals and Chemical Corporation operated the Achan and Noralyn mines.

Virginia-Carolina Chemical Corporation operated its Clear Springs and Homeland mines; all matrix being treated in the Homeland plant.

will control sales of all output; much is expected to go to 15 midwest farmers' cooperatives.

The Kerr-McGee-Phillips Petroleum-Farmers Union joint company continued metallurgical testing and plant design but made no effort to bring its mine (Carlsbad's newest) into production. In Grand County, Utah, Delhi Taylor Oil Company continued to prove deep reserves but made no plans to start mining in face of low price and abundant supplies.

PHOSPHATE

Growth rate is about 3 percent per year

The Kibler-Camp operation in the hard rock field built a new plant between Hernando and Dunnellon.

T.V.A. continued its reserve acquisition campaign in the hard rock field.

TENNESSEE: The bulk of the rock production is used by the electric furnace industry—some 93 percent. The three furnace operators are Hooker Chemical Company, Victor Chemical Works, and Monsanto Chemical Company. There were no major changes in these furnace operations during the year. Mining operations are numerous open-pit mines on brown rock.

Hooker Chemical Company acquired the Shea Chemical Company during the year.

International Minerals and Chemical Corporation mined at Wales producing rock for direct application.

Virginia-Carolina Chemical Corporation operated mines in the Mt. Pleasant area, and their Mt. Pleasant plant produced fertilizer and rock for direct application.

WEST: Nearly two-thirds of the western rock was produced for the electric furnace industry.

Montana Phosphate Products Company near Garrison, Montana, operated the Anderson and Luke underground mines and the Anderson surface mine. Developments continued for adding mining the Anderson structure.

Victor Chemical Works operated its underground Canyon Creek and Maiden Rock (Anderson) mines located 30 miles south of the electric furnace plant at Silver Bow, Montana.

The open-pit Centennial mine located 30 miles east of Mondia was operated during the summer by J. R. Simplot Company. Production goes to Canada. The company also operated its open-pit Gay mine north of Pocatello, Idaho, with low-grade going to Westvaco Mineral Products Division (Food Machinery and Chemical Corporation) electric furnace plant at Pocatello. High grade goes to the Simplot fertilizer plant also at Pocatello.

Monsanto Chemical Company operated its Ballard mine, north of Soda Springs, Idaho, and treated the product in the electric furnace plant at Soda Springs. The company completed the major part of a new private haul road which will go into operation early in the 1959 season with 100-ton truck units.

The Anaconda Company mined open-pit during the summer at its Conda mine north of Soda Springs, Idaho. Rock is shipped to the company's fertilizer plant at Anaconda, Montana.

Central Farmers Fertilizer Company, a mid-western co-op, was in active construction of an electric furnace plant and fertilizer plant in Georgetown Canyon near Georgetown, Idaho. Their nearby open-pit mine went into operation in the fall transporting ore to the plant by conveyor.

San Francisco Chemical Company conducted underground mining operations in the Utah Crawford Mountain area near Leefe, Wyoming, and open-pit operations at Leefe, Wyoming, and Montpelier, Idaho. The Utah and Wyoming ore is processed in the new flotation plant at Leefe. Development continued in connection with a large property near Vernal, Utah.

In October the Bunker Hill Company, Kellogg, Idaho, announced plans to build a \$10,000,000, two hundred thousand ton-per year, fertilizer plant to be in operation in mid-1960. A phosphate lease was acquired in Montana.

SULPHUR

United States production of elemental sulphur declined in 1958 in line with lowering of consumption by major industries, such as steel, paper, oil refining, and rubber. Nearly three quarters of the total production 6,260,000 long tons (7,000,000 in 1957) was French process sulphur from Gulf Coast salt

domes. Other sources were: 630,000 tons as a petroleum refining byproduct (sour oils and natural gases), 400,000 from roasting pyrite, and 520,000 tons from other sources.

Texas continued as the world's largest producer at 2,600,000 tons, and was followed by Louisiana at 2,055,000 tons. Mexican

production of Frasch process sulphur expanded to about 1,250,000 tons (1,000,000 in 1957) and shipped about 600,000 to the United States. Canadian production of petroleum by-product sulphur increased and shipments to the United States were about 160,000 tons. As Canada's oil refining industry grows, sulphur recovery also grows with new plant capacity started in 1958 to recover about 400,000 annual tons.

Paradoxically, the United States is the largest importer and exporter of sulphur in the world. Exports approached the all-time high of 1,650,000 tons set in 1956.

Texas Gulf Sulphur Company continued as the largest domestic producer with four Texas mines as it opened its new Fannett, Texas mine in May. Freeport Sulphur Company, in second place with four Louisiana mines, made rapid progress to bring two new salt dome mines in production. The largest, at Grand Isle, Louisiana, is seven miles from land and requires a steel platform nearly a mile in length above high water. Production is scheduled in 1960. The second Freeport mine under development is near the sea coast at Lake Pelto.



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Industrial uses of silver accounted for better than half of the estimated 250,500,000 troy ounces of silver consumed in the free world in 1958. Furthermore, industrial uses are expected to continue to expand in the future so that the traditional use of silver in the arts will become less and less important to the producers of silver as an outlet for their product.

Yearly consumption of silver in the free world for all uses including coinage during the past decade has consistently exceeded the yearly mine production of new silver, see Table No. I. During this period, additional supplies were made available to the market from de-monetized stocks held principally by Cuba and England. Russia also supplied about 18,000,000 ounces of bar silver to the free world markets during this period. In addition, there is an estimated 20,000,000 to 30,000,000 ounces of silver per year available to world markets from salvage. The big question is where will the additional supplies come from in the future?

TABLE NO. I
A Decade of World Silver Production and Consumption¹

Year	Mine Production ²	Consumption ²	
		Arts & Industry	Total With Coinage
1949	156.9	132.5	216.3
1950	176.7	157.4	201.5
1951	172.9	165.0	155.5
1952	188.8	142.1	256.4
1953	194.0	168.3	259.1
1954	186.5	160.8	244.2
1955	195.7	192.8	245.4
1956	194.4	210.2	266.7
1957	196.0	209.8	289.4
1958	201.7	187.4	250.5

1. Millions of troy ounces. 2. U. S. Bureau of Mines ex Russia and Satellites. 3. Handy & Harmon, ex Russia and Satellites.

The following brief resume shows where increased uses of silver are developing and why increased mine production is needed.

The largest and most important industrial use of silver continues to be in the photographic field for sensitized paper and for film for amateur photography, commercial and professional photography, X-ray and professional motion pictures. An estimated 28,000,000 to 32,000,000 troy ounces of silver is consumed annually in the United States in the photographic field and about an equal amount for this purpose in the rest of the free world.

The use of silver solders for brazing or otherwise bonding

Jefferson Lake Sulphur Company operated two mines in Texas and one in Louisiana. Duval Sulphur and Potash Company operated one mine in Texas.

Mexican production expanded and sales were good throughout the year. Pan American Sulphur Company's goal of 800,000 tons was reached; the Gulf Sulphur Corporation's target was 260,000 tons; and Petroleos Mexicanos 70,000 tons—the latter to supply 80 percent of Mexico's needs. Stockpiling of sulphur continued at an annual rate of 100,000 tons by Texas Gulf Sulphur Company's subsidiary—Cia Exploradora del Istmo. The new 250-ton-per-day plant of Texas International Sulphur Company at Textistepec dome was completed. Duval Sulphur continued examination of properties and negotiated (reportedly without success) for Texas International's mines.

World capacity continues to expand; expansion is markedly as a byproduct of petroleum refining in France, England, Japan, Australia, and South Africa. Roasting of pyrite declines in importance. There is adequate sulphur available for any foreseeable demand over the next 10 years.

SILVER

Industrial uses will continue to expand

together practically all non-ferrous metals and alloys as well as iron and steel is the second most important industrial outlet for silver. Annual consumption of silver for solders in the United States currently amounts to about 24,000,000 to 27,000,000 troy ounces.

The third most important and rapidly growing industrial use of silver is in the electrical industry for all forms of electrical contacts where low contact resistance is important. An estimated 18,000,000 to 20,000,000 troy ounces of silver is used annually in the United States for this purpose.

A growing industrial use of silver is in the manufacture of primary and secondary silver-zinc batteries. Primary cells are designed for one shot applications but secondary cells or rechargeable batteries can be used over a number of discharge-recharge cycles. Silver-zinc batteries find their biggest use in equipment requiring high power—output with minimum weight and size. Silver-zinc batteries are as much as six times lighter and five times smaller than other batteries of similar capacity. In addition, the silver-zinc cell discharges at constant voltage levels.

The outlook for increased silver production in the world depends upon not only the price of silver but also upon the price of copper, lead and zinc. The reason for this is that today very little silver is the primary objective of mining. Silver is now usually recovered as a by-product of mining for copper, lead and zinc with which ores it is commonly associated. Since it is the overall revenue per ton of ore that determines whether a particular deposit can be mined, a fair price and a good market for silver encourage the production of the associated metals and vice versa.

Barring any tremendous expansion in the production of copper, lead and zinc (which seems highly unlikely at the moment) and any drastic drop in the price of silver, the world production of newly mined silver over the next few years should continue at levels of the past few years. This outlook for supply considered in the light of growing industrial demand would indicate that the price of silver, on world market, over the next few years is likely to continue at or improve somewhat over the price levels of the past few years.

Table No. II shows where silver has come from in the last several years.

United States Mine Production Of Silver
by States in 1956, 1957, and 1958¹

State	1956	1957	1958
Alaska	28,360	28,862	28,000
Arizona	5,179,185	5,279,323	4,669,000
California	938,139	522,288	191,395
Colorado	2,284,701	2,787,892	1,974,000
Idaho	13,471,916	15,067,420	15,564,510
Montana	7,385,908	5,558,228	3,395,000
Nevada	1,220,473	958,477	936,600
New Mexico	392,967	309,385	145,300
South Dakota	136,118	134,737	150,000
Utah	6,572,041	6,198,464	5,010,000

1. Preliminary.



By Ray G. Sullivan
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TUNGSTEN

Two or three mines will start at \$30.00 a unit

The disastrous market collapse of tungsten prices in 1958 left only two domestic producers at the end of the year. American Metal-Climax, Inc. is a byproduct producer from molybdenite tailing, while the second, Union Carbide Nuclear Company at Pine Creek, California also produces molybdenum and copper. Use was down, too, dropping about 40 percent below 1957 to 340,000 units.

Fortunately, both demand and price turned up in October from the year's low, and price rose from \$15.00 to \$16.00 per unit to \$20.00 to \$23.00 per unit.

Present rate of production, 10,000 units per month, is estimated to be only 21 percent of consumption. Stocks of finished domestic concentrate which were approximately 300,000 units in June 1958 were somewhat reduced during the last six months of 1958, although this reduction has not been as great as shut-down producers had desired. The gap between consumption and domestic produced tungsten has been satisfied by imports.

With the exception of countries still producing and shipping to the United States Government stockpile, the foreign mine curtailment and shutdown was of the same scope and degree as in the United States. Brazil was the one remaining foreign nation shipping to the Government stockpile, such shipments to continue to December 31, 1959.

Tungsten mines throughout the world have shut down in face of abnormally low prices and shrinking markets. It is safe to say production in the free world is below consumption.

The largest single shipping nation, Republic of Korea, was forced to close down operations at its Sang Dong mine early in October.

During 1958, the excess stocks from Burma, Thailand, Peru, Bolivia, and King Island, to mention but a few, were in the greater part consumed. Tungsten production virtually ceased in these countries. Cutbacks in production were made in Portugal and Spain. Some new production emanating from Russia and Red China found limited markets in West Germany, Austria, and other European countries. The quantity available from Red-dominated countries is unknown, but past experience has led us to believe that this source can be substantial, possibly approaching in scope that produced by South Korea.

The enumeration of the above production and consumption data, together with the short discussion of the present status of the significant producing areas of the world, is given only to evaluate our domestic production potential through 1959. From this study we believe that approximately a minimum of 1,000,000 units will be consumed in the Free World this year providing that our joint economy expands as now predicted. Of this amount, approximately one half or 500,000 units will be consumed in the United States for a monthly average of 41,700 units. We can substantiate an average monthly import from Korea and other countries of approximately 13,500 units. Added to the monthly imports would be our current domestic production of 10,000 units and a reduction of present inventories of 10,000 units which would leave a gap to be filled from new production of approximately 8,200 units per month.

Increased demand and liquidation of stocks will be followed by gradual raises in prices which would attract reopening or expansion of mines having the lowest costs. The reopening stage is not anticipated until sometime after midyear or when prices for tungsten reach a minimum of \$28.00 to \$30.00 per short ton unit, duty paid.

A canvass of the past leading producers now shut down indicates that \$28.00 to \$30.00 per unit will reactivate two or three large mines with an aggregate monthly production potential of 20,000 units. Should demands further increase, the indications are that prices would of necessity be further raised to \$35.00 per unit before additional production would be stimulated.



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URANIUM

AEC modified purchase contracts through 1966

A number of significant developments and changes occurred in the domestic uranium raw materials procurement program in 1958. These include several important announcements by the United States Atomic Energy Commission, a continued increase in ore production in the Western United States, new mills going into operation, and the expected increase in concentrate receipts.

Uranium ore production in the United States totaled approximately 5,200,000 dry tons during 1958, as compared to 3,700,000 tons in the previous 12 months. Domestic uranium concentrate production amounted to 12,500 tons of U_3O_8 , and at the year's end, was at a rate of 15,000 tons annually. Concentrate production in 1959 will approximate 18,000 tons of U_3O_8 , having a value of more than \$300,000,000—which may be about the level of production through 1966. This will require an annual ore production rate of about 7,500,000 tons.

Uranium ore reserves at the end of 1958 were at that time estimated to be approximately 82,500,000 tons averaging 0.27 percent U_3O_8 , as compared to estimated reserves of approximately 76,000,000 tons averaging 0.27 percent as of December 31, 1957. In addition, there were approximately 1,750,000 tons of ore in government and private stockpiles at the end of 1958.

As the year closed, there were 23 uranium processing mills in operation in the western United States. Nine of these mills went into production during the year. These 23 mills have a total rated capacity of about 21,000 tons of ore a day, and the estimated total capital cost is \$134,928,000. In addition to the foregoing full scale mills, the Cotter Corporation placed its pilot mill at Canon City, Colorado, on stream in July 1958.

On April 2, 1958, the Commission announced its policy of providing an ore market in certain areas having no market or an inadequate market, and of providing a larger market for ores from independent mines in areas where milling capacity appeared adequate but not sufficient for the developed independent ores. This action revised the Commission's October 28, 1957, announcement that it would suspend contracting for delivery prior to 1962 of concentrates which would involve additional milling capacity. The revision applies to ores developed prior to November 1, 1957.

The April 2 announcement anticipated additional concentrate purchase contracts which could result in the following additional milling capacity in specified areas:

States	New Mill Capacity Tons Per Day
Wyoming	1,700
Southeast Texas	600
North Dakota-South Dakota (lignites)	600
Colorado Front Range	200
Nevada (Austin)	200
Total	3,300

The April 2 limited expansion program was designed to provide additional milling facilities for those areas having no market or an inadequate market for ore reserves developed as of November 1, 1957. At the year's end, the Grand Junction Operations Office had completed negotiations with five Wyoming operators which would increase the state's milling capacity by more than 1,700 tons per day. The plan contemplates expansion of the three existing mills and building two new mills. The additional milling capacity being considered in the agreements for Wyoming in tons per day is distributed among the following companies:

Company	Present Capacity T/Day	Added Capacity T/Day	New Rate T/Day
Western Nuclear Corporation*	444	401	845
Lucky Mc Uranium Corporation*	833	167	1,000
Fremont Minerals, Inc.*	555	169	724
Federal Uranium Corporation		522	522
Globe Mining Company (Union Carbide Nuclear Company)		492	492
Totals	1,832	1,751	3,583

*Expansion of existing facilities

In August the Commission executed an amendment to its contract with Texas Zinc Minerals Corporation which provided for treating increased amounts of ore from independent producers at the company's mill at Mexican Hat, Utah.

The modified contract also extended the agreement from March 1962 to December 1966. Similar amendments of existing contracts with mill operators in other areas may be considered.

On November 24, 1958, the Commission announced a modification of the 1962-1966 domestic uranium concentrate procurement program.

The Commission had announced on May 24, 1956, that it would guarantee the purchase of U_3O_8 in concentrates produced and delivered during the period April 1, 1962, through December 31, 1966. In its November 24th notice the Commission announced its plans to carry out its commitment with respect to ore reserves developed prior to November 24, 1958, in reliance upon the May 24, 1956, announcement by negotiating for the purchase of appropriate quantities of concentrate derived from such ore reserves during the 1962-1966 period. Such purchases are to be at the previously established price of \$8.00 per pound of U_3O_8 in acceptable concentrates.

By issuing the November 24, 1958, announcement, the Commission withdrew prospectively the concentrate purchase program announced May 24, 1956. With respect to new ore reserves developed after November 24, 1958, the Commission will make contract to purchase concentrates to the extent that requirements dictate and on such terms and conditions and at such prices as the Commission may from time to time agree upon.

Under this revised program, the Commission's 1962-1966 domestic uranium concentrate purchases from ore reserves already developed will be limited to (a) current milling contracts; (b) appropriate extensions of current milling contracts to the extent the Commission determines that the milling facilities are needed for the presently existing mining operations and developed ore reserves; (c) new milling contracts or amendments to existing contracts which may be executed pursuant to the Commission's April 2, 1958 announcement of the limited expansion of the domestic uranium procurement program; (d) new milling contracts or contract amendments which may be negotiated for the purchase of appropriate quantities of concentrates in the 1962-1966 period from ore reserves developed between November 1, 1957, and November 24, 1958.

All new contracts or contract amendments are to contain provisions designed to provide equitable treatment for the independent miner including a fair share of available milling capacities.

On May 8, 1958, the Commission announced that domestic producers of uranium ores and concentrates could now make private sales of these materials to licensed domestic and authorized foreign buyers for peaceful uses of atomic energy. Inquiries were received by producing companies from domestic and foreign purchasers and a few tons of uranium were sold. The present market, however, appears to be for small amounts for experimental purposes.

Deliveries under long-term contracts from foreign producers totaled 19,000 tons of U_3O_8 during 1958, compared to 11,794 tons during 1957.

In Canada there were 19 uranium facilities in operation, including two government-owned plants. Production climbed gradually through 1958 as newly completed mills worked up to rated capacity. By the end of the year it was approaching the anticipated maximum annual rate of about 15,000 tons of U_3O_8 , part of which will be shipped to the United Kingdom. Canadian deliveries to the United States during 1958 totaled 12,800 tons of U_3O_8 , as compared to deliveries of 6,000 tons in 1957.

The Geologic Survey of Canada announced in August that Canadian ore reserves stood at 377,000,000 tons of measured, indicated, and inferred ore containing an estimated 392,000 tons of uranium oxide, 92 percent of which was in the Blind River area.

At the year's end in South Africa there were 17 authorized plants in operation. Negotiations in South Africa in May resulted in agreement with the South African Atomic Energy Board that, beginning July 1, 1958, production deliverable to the Combined Development Agency would not exceed 6,200 tons of U_3O_8 annually.

TITANIUM

The one word to describe the titanium industry in 1958 was down. World and United States production and consumption of ilmenite, rutile, titanium dioxide pigments, and titanium sponge all dropped. As the United States government's requirements for titanium metal were cut, the blow was felt all the way back to the mines. Sponge output was about 4,500 tons, 17,000 in 1957.

With reduced demand for concentrates, the Marine Minerals Division of Heavy Minerals Company closed its dredge in South Carolina, and beach sand plant at Panama City, Florida. Union Carbide Company stopped installation of its floating, bucket-line dredge on Amelia Island, Florida. The largest domestic producers—National Lead Company's Tahawus, New

York hard rock mine, and the Du Pont Company's Florida beach sand operations—both reduced output of concentrates. United States production declined to about 600,000 short tons.

Exploration continued, especially in Tennessee where DuPont acquired large reserves near Lexington. New Jersey exploration slowed somewhat but American Smelting and Refining Company, and American Metal-Climax, Inc. have large deposits there.

The decline in Australian production of both rutile and ilmenite are detailed in the Australian section of this Yearbook.

Africa was the scene of increased activity. In South Africa, the new beach sand plant of Umgababa Minerals Ltd. was commissioned to treat 7,000 tons per day.

ZINC

The zinc industry began the year 1958 with problems created by the general business recession. Supply was in excess of demand. Depressed prices persisted until October; then there was modest improvement. Factors which contributed to a general upturn and to a definite feeling of optimism for 1959 included the business recovery itself (which began in the late spring); a significant decrease in domestic produc-

tion; reduced imports, accelerated by imposition of United States government import quotas on October 1; and the recovery in prices in October and early November.

Mine production fell to 402,919 tons, lowest since 1933, and down 24 percent from 531,735 tons in 1957. Tennessee where major discoveries have been made and new mines placed in production in recent years was the largest producer—58,531

tons up from 58,063. American Zinc Company of Tennessee placed its new Coy mine in production. New Jersey Zinc Company doubled capacity to 2,000 daily tons and completed but did not place its new Flat Cap mine in production. Tennessee will continue as a leading zinc state for many years.

New York dropped to second place as St. Joseph Lead Company operated its Balmat and Edwards mines on four day weeks part of the year.

Idaho ranked third in production as major Coeur d'Alene district mines cut to four day week early in the year. Utah production, primarily from the United States and Lark mines of United States Smelting Refining and Mining Company was up slightly to 42,400 tons. Output in other states was down and the Tri-State district produced less zinc and lead than for many years.

In the opinion of the American Zinc Institute, the problems of the zinc industry are not basically problems of consumption. Rather, they arise from over-supply, stimulated by world political conditions in recent years and from uncertainties in government procurement policies. Reduced zinc consumption in 1957 and early 1958 simply reflected general business conditions. Zinc's position in the industrial economy is considered strong and permanent.

Slab production in the United States was about 21.5 percent less than in 1957, and at a level which has not existed since 1946. While there were some labor problems during the year throughout the industry, they were not numerous and played no major part in the net decrease in production. Mine operations were similarly adjusted downwards. Shipments by domestic producers were not significantly different to U. S. consumers than in 1957, but were curtailed completely to the government after April. Export shipments were sharply off and total shipments were down about 16 percent.

Consumption finished strongly in the fourth quarter with an estimate of net usage for the year between 12 and 13 percent under that of 1957. This estimate is based on 10-month data, from the U. S. Bureau of Mines, and has been extended conservatively. There is some well qualified opinion that final figures on consumption will prove this 816,000-ton estimate to be significantly low. Bright spots in consumption included a sharp recovery in the field of galvanized sheet, which is expected to result in a total consumption in all gal-

vanizing slightly higher than in 1957. The recovery of the automotive industry in the last quarter had a favorable influence on the consumption of zinc for die casting, as well as for zinc in brass in that period—but for the full year there was a sharp drop. The other major outlets for zinc—in rolled form, as an oxide, and in other chemicals—were essentially parallel with the national levels of business activity.

Stocks at smelters showed a net increase for the year of about 14 percent. Curtailment of production, the influence of increased consumption starting mid-year, and modest price increases, reacted favorably on the smelters' stock situation so that they dropped progressively from July onward. Stocks in the hands of consumers, as reported by the U. S. Bureau of Mines, showed a general trend downward until the latter months of the year, and at the end of November were about 9 percent lower than as of December 31, 1957.

Imports were down significantly during the first nine months of the year, and then came under the added influence of the President's quota system announced September 22 and effective October 1. Imports for the year were off about 14 percent in ore and about 33 percent in slab.

To generalize on the circumstances which concern zinc, it would now appear that the corner has been turned on the road to broad industrial recovery, and that the zinc industry can reasonably expect to share in better times ahead. Specific bright spots are to be seen in the fields of zinc's great outlets—die casting and galvanizing.

The galvanizing of steel to be used directly or painted is increasingly recognized as sound economy. Within the field, the largest growth is probably to be found in galvanized steel sheet. Statistics of the American Iron and Steel Institute show that whereas galvanized steel sheet occupied only 2.5 percent of total steel shipments in 1948, its share of the entire steel market in 1958 will prove to have been about 4.7 or 4.8 percent.

In the field of die casting, zinc's unique properties continue to be attractive. The greatest outlet for zinc die castings is the automotive industry. It is of major importance to recognize that between 87 and 88 percent of the zinc die castings used in the 1959 models of the American motor cars are functional or functional and decorative. Those few applications which are decorative only, may be expected to fluctuate from year to year with styling trends.

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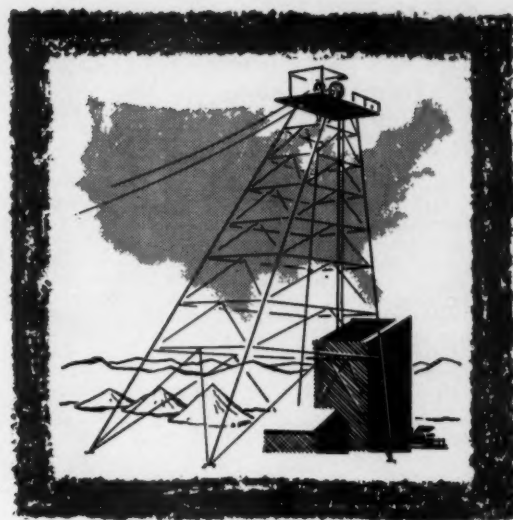
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A Look at U. S. MINING IN 1958

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Alaska

► Iron Prospects Catch and Hold Interest of Many Companies in 1958

Gold production held steady in 1958, though lode gold mining is practically nonexistent and placer operations continue to be squeezed by increasing costs. The major portion of Alaska's gold output was produced, as usual, by United States Smelting, Refining and Mining Company from its dredging operations. This company has announced, however, that its largest operations will be forced to close by 1963 or 1964 under the present economic trends. Goodnews Bay Mining

Company operated as usual in the Bristol Bay area and continues to be the largest United States platinum producer. DeCoursey Mountain Mining Company had various difficulties during the year and it was unable to produce as much mercury as in 1957. Kenai Chrome Company had just started its seasonal operation when the GSA purchase agreement ended and caused a complete halt to further activity. The uranium operation started in 1957 by a subsidiary of Climax Molybdenum Company did not resume in 1958.

SOUTHEASTERN—The long-disputed Yakobi Island nickel deposits were finally cleared of litigation and were the scene of an intensive drilling project by Devamin Company, a Canadian firm. Columbia Iron Mining Company (U.S. Steel) continued its exploration activities on various iron deposits and particularly on the Kluk-

wan property where they explored further the alluvial portion of the deposit. Mt. Andrew Mining Company (Utah Co. of the Americas) continued drilling iron deposits on Kasaan Peninsula of Prince of Wales Island and investigated others. Magnetic work was done on a relatively new large iron show in the Bradfield Canal area. Promising nickel and copper discoveries were made in Southeastern Alaska.

SOUTH CENTRAL—Preliminary steps have been taken toward a large exploration project in the undeveloped Bering River coal field to determine if a large-scale mining and shipping operation can be made feasible for the purpose of exporting coking coal to the Japanese steel industry. Humble Oil and Refining Company discovered an apparent major body of iron in the course of its oil exploration work, and staked a group of 815 claims there.

YUKON BASIN—Exploration was continued in the mercury belt. One significant new discovery was made. Sunshine Mining Company spent its second season drilling a prospect near Kagati Lake. Cordero Mining Company was also active in the mercury belt. Two vermiculite discoveries were made in the Forty-mile District.

NORTHWESTERN—Rhinehart Berg's Ruby Creek copper prospect north of the Kobuk River was drilled for the second year by Bear Creek Mining Company (Kennecott subsidiary).

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Arizona

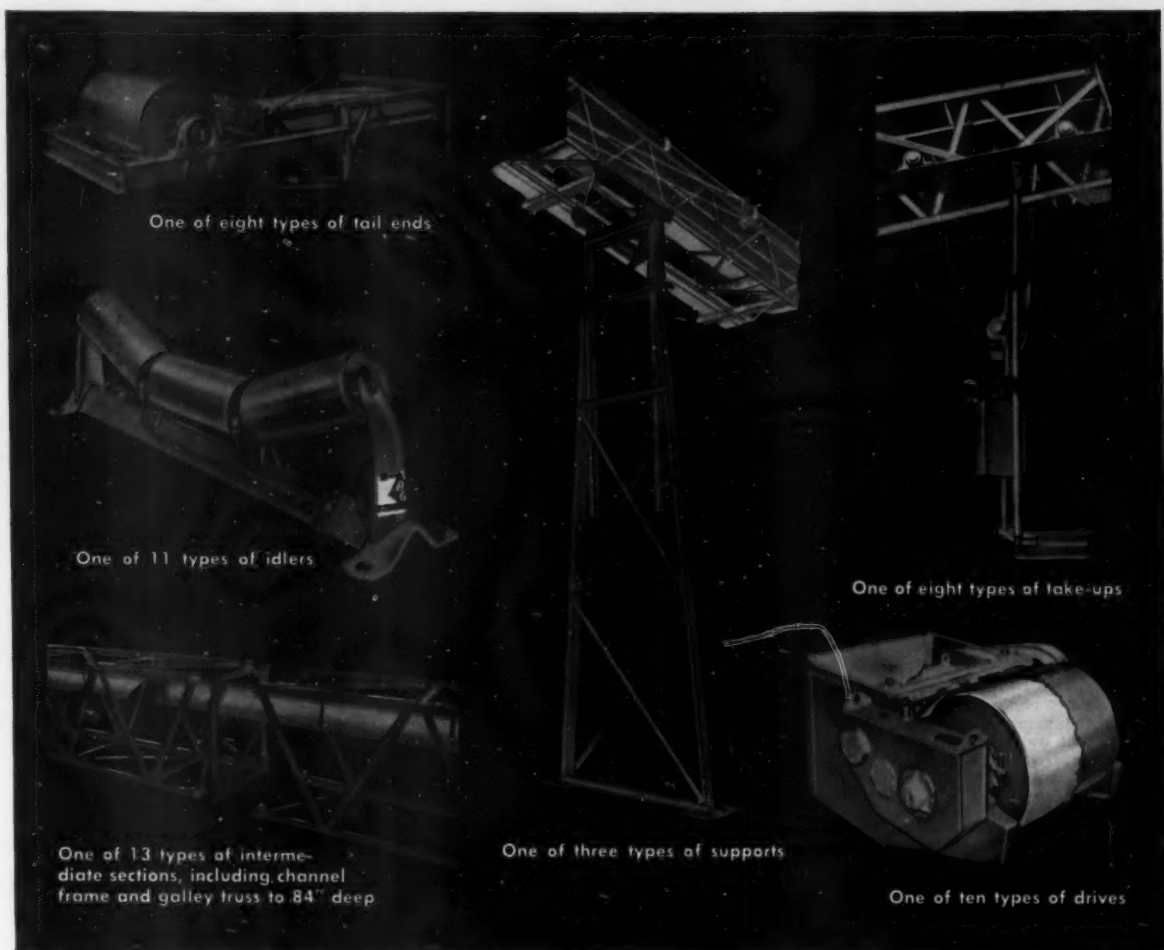
► For Copper: A Smelter and LPF Plant at Ray and a Mine and Mill for Duval

In 1958, Arizona produced more than 50 percent of all copper mined in the United States. Most of the state's 13 major copper mines were worked at reduced capacity as producers endeavored to bring production and consumption into balance. Only 5 mines—San Manuel Copper Corporation, Inspiration Consolidated Copper Company, Pima Mining Company, Bagdad Copper Corporation, and the Silver Bell unit of American Smelting & Refining Company—reported a 1958 output comparable to 1957. At the end of the year, however, production at most copper mines had returned to a near-normal pattern.

OUTSTANDING EVENT of 1958 was the completion of the smelter and leach-precipitation-flotation plant by the Ray Mines Division of Kennecott. The first two carloads of anode copper were shipped on July 3. The smelter and L-P-F plant are part of the \$40,000,000 expansion program which will permit a 50 percent increase in production from the Ray pit and a 40 percent increase in blister copper output over the 1956 rate. The ASARCO smelter at Hayden went on a full custom basis September 1, following the termination of its long-standing contract with the Ray mines.

Arizona's newest major copper mine reached the production stage early in 1959. This is the Esperanza open pit of Duval Sulphur & Potash Company, southwest of Tucson. Isbell Construction Company is stripping and mining the deposit; Stearns Roger Manufacturing Company built a 10,000 ton-per-day concentrator. Preliminary work started in 1957.

Also near Tucson, American Smelting and Refining Company completed a planned phase of surface drilling and



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85

underground exploration at its East Pima orebody and announced the discovery of a major copper deposit. Extensive exploration projects also were conducted by Inspiration at the Christmas mine at Winkelman, and by Bear Creek Mining Company near Safford.

A circuit for the recovery of by-product molybdenite from the copper concentrate of Inspiration Consolidated Copper Company's mill at Inspiration was completed. First sales of finished molybdenum concentrate were made during the third quarter of the year.

URANIUM OUTPUT was valued at \$7,012,000, compared with \$6,277,000 in 1957. Production came from the Four Corners area, from near Cameron, and from Western Gold and Uranium Company's Orphan mine at Grand Canyon. The grade of ore produced at the Orphan was approximately 1 percent uranium oxide. The state's only uranium processing plant—the Tuba City mill of Rare Metals Corporation of America—operated throughout the year, handling approximately 300 tons of ore per day.

Mohave Mining and Milling Company of Wickenburg, one of the major manganese producers, treated an average of 200 tons of ore per day at its mill and sintered an average of 100 tons daily. From one-half to one-third of the total tonnage treated was custom ore which originated near Globe. Manganese mining is expected to continue until the termination of the government's purchase program, about the fourth quarter of 1959.

Shattuck Denn Mining Corporation continued a metallurgical development program. A large drop in zinc output resulted when Cyprus Mines Corporation

suspended operations at the Old Dick mine near Bagdad. Since the shutdown the company has employed a small crew on exploration drifting work and diamond drilling.

The nonmetals group, including asbestos, bentonite, feldspar, fluorspar, sand and gravel, accounted for only 8 percent of the total value of Arizona's mineral production.

California

► **At End of Year it Had the only Active Tungsten Operation in the U.S.**

IRON ORE was mined more efficiently at Kaiser Steel Company's Eagle Mountain mine where larger mining equipment, including 9-inch blast hole drills, 64-ton end dump trucks, and 90-ton ore cars were employed. The jig concentrator was improved by the installation of an enlarged tailing water settling tank. Production at Eagle Mountain ran about 80 percent of the amount produced in 1957; this was far higher than the national average rate of output from iron mines elsewhere in the country.

TUNGSTEN mining touched a new low. By December, Union Carbide Nuclear Company's Pine Creek mine, near Bishop, California, was the only active producer in the entire United States. Continued operation at the Pine Creek mine was aided considerably by the re-

covery of by-product molybdenum from the ore.

CHROMITE MINES were very active in the first half of 1958. But by June the purchase quotas in the General Services Administration program was filled and producers closed most operations. Most of the output was obtained from the large open-pit mines in San Luis Obispo and Fresno counties. Substantial amounts of milling grade ore are believed to remain at these properties.

GOLD: There was notable increase in the number of mines that were active in 1958. Appreciable quantities of lode gold were mined in the Alleghany-Downieville area of Sierra County, the Hazel Creek mine in Eldorado County, the Siskion mine on Dillon Creek in Siskiyou County, the Dannebrog mine in Yuba County, and the Yankee John mine in Shasta County. The drift mines of Butte County were also active. Three bucket-line dredges worked the flood plain of the American River in Sacramento County. Three additional dredges produced from the lower Yuba River, and a dragline dredge began operating on Cherry Creek east of Fort Jones in Trinity county.

MERCURY was highlighted by a 30 percent increase in production over 1957. With the end of the government purchase program at the close of 1958, the rate of production will slow this year. Principal producing mines were New Idria Mining & Chemical Company, the Abbott mine of Cog Minerals Inc., the Buena Vista mine, Mt. Jackson mine, and the New Almaden and Guadalupe mines.

BORAX: Competitive economic studies of stripping methods continued at United States Borax & Chemical Corporation's

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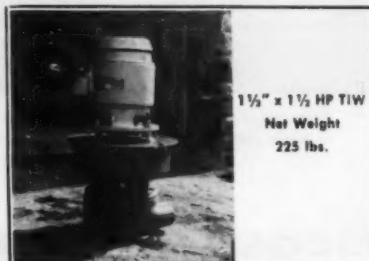
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Percent Solids	Sp. Gr. Pulp	TONS SOLIDS PER 24 HOURS				
		GALLONS PER MINUTE				
		20	30	40	50	60
10	1.07	13	19	26	32	48
20	1.14	27	41	55	68	82
30	1.23	44	67	89	111	133
40	1.34	64	97	120	161	193
50	1.46	87	130	174	217	261

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mine near Boron. Bucketwheel excavation with conveyor disposal of waste may be a possibility.

OTHER NON-METALLICS: Production was down due to the recession but the dip was small (output was about 5 percent under 1957). Numerous consolidations and mergers of companies and facilities took place during 1958 to improve financial standings.

PYRITE was produced chiefly from the Iron Mountain open-pit mine of Mountain Copper Company Ltd. Copper concentrates were recovered at a small flotation mill north of Hoopa from sulphide ore mined underground at the Copper Bluff mine. A plant is under construction at Arcata to make chemicals from copper and zinc concentrates.

EXPLORATION: An extensive exploration program for nickel in lateritic and serpentine was conducted at Red Mountain and Little Red Mountain north of Laytonville in Mendocino County. A gossan deposit in Bear Valley north of Redding was examined. Several search programs were underway in the desert areas of Southern California for borax deposits. Early in 1957 a colemanite deposit was reported to have been discovered east of Mojave. Details were reported by the United States Geological Survey.

Central

► Iron and Lead Projects Continue in Missouri; Zinc Output Up in Illinois

MISSOURI: Shaft sinking dominated the scene in 1958. Meramec Mining Company worked on two shafts to develop high-grade iron ore reserves at Pea Ridge, Missouri. St. Joseph Lead Company continued work on a shaft near Viburnum, Missouri, where a lead discovery is being developed.

The Meramec project is planned for an eventual capacity of 2,000,000 tons of pellets annually, and is expected to be in production in the latter half of 1962. Drilling in 1957 indicated large reserves of 60 to 65 percent iron ore. It will be beneficiated and pelletized to 71 percent iron making one of the world's highest grade concentrates. The No. 1 shaft was down to 1,080 feet at the end of November, and work was started on the No. 2 shaft approximately 1,000 feet to the north. Both will go to an eventual depth of about 1,000 feet, and both are circular, concrete-lined excavations. Meramec is a joint undertaking by St. Joseph Lead Company and Bethlehem Steel Corporation.

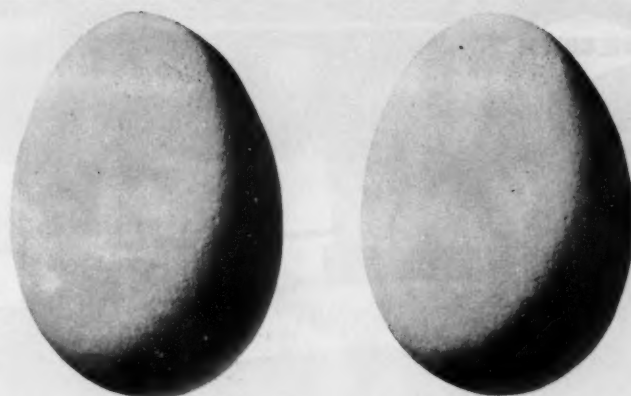
The Viburnum development of St. Joseph Lead is proving a higher grade deposit than Missouri's Lead Belt district. The new area is expected to produce 3.5 to 4.0 percent lead ore. Production is ex-

Please Turn To

Page 106 to check Minnesota, Michigan, and Wisconsin mine shipments of iron ore.

Page 201 for listing of tonnages mined at important U. S. open pit mines.

Page 202 to see the rank of the major underground U. S. mines.



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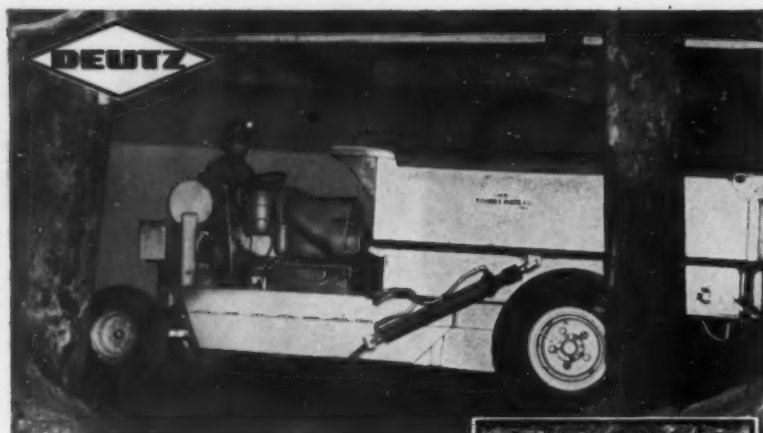
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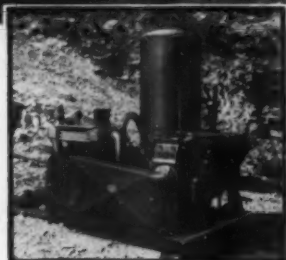
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PARTIAL SPECIFICATIONS TABLE

MODEL	BHP	RPM
F 1 L 712	10/12	2000/2300
F 2 L 712	20/24	2000/2300
F 3 L 712	30/39	2000/2300
F 4 L 712	40/52	2000/2300
F 6 L 712	60/78	2000/2300
A 2 L 514	28	1800
A 3 L 514	42	1800
A 4 L 514	56/72	1800/2000
A 6 L 514	84/110	1800/2000
A 8 L 614	112/145	1800/2000
A12 L 614	170/220	1800/2000

pected in 1960. It may take up to four shafts to develop the zone.

St. Joseph Lead closed the Mine La Motte operations near Fredericktown, Missouri except for development work at No. 26 shaft. The company's mine research department is engaged in developing ways of mining ore-bearing pillars and increasing efficiency in development of new mines. American Zinc, Lead & Smelting Company conducted a drilling program in the Bourbon, Missouri area in conjunction with Granite City Steel Company.

ILLINOIS: Hydrometals Inc. acquired exclusive world-wide licensing rights to the new electro-thermal process for single-step reduction of metallic oxides. Reportedly the process makes possible economic production of many metal oxides, including columbium, tantalum, boron, tungsten, vanadium, titanium, beryllium, zirconium, and others involving costly reducing techniques.

Allied Chemical Corporation started installation of a simplified refining process for converting uranium ore concentrate into gaseous uranium hexafluoride at a 5,000-ton-per-year plant at Metropolis. Concentrate is fed into a fluid-bed reactor where it reacts with hydrogen gas and is reduced to uranium dioxide. In a second reactor the dioxide is reacted with hydrogen fluoride and converted to tetrafluoride. In a third reactor it is fluorinated and converted into uranium hexafluoride (UF₆).

Jersey Quarry Company apparently discovered diamonds in a soapstone strata 155 feet below the surface near Jerseyville, Illinois.

In northern Illinois, both major producers, the Eagle Picher Company and Tri State Zinc, Inc. operated mines throughout the year. Zinc was recovered as a by-product from the fluorspar mines of southern Illinois. Zinc output in Illinois was higher than in 1957, due chiefly to increased by-product recovery from fluorspar mining.

Magnet Cove Barium Corporation installed expanded crushing facilities at its Malvern, Arkansas, barite plant. The new equipment permits the crushing of boulders which could not be handled in the past.

Reynolds Metal Company expanded operations at the Jones Mills, Arkansas, aluminum reduction plant.

Colorado

► Record U₃O₈ Tonnage Milled; Colorado and Empire Zinc Lead in Base Metals

Colorado's uranium mills treated a record tonnage of 920,000 tons of ore in 1958. At year's end eight mills were in operation, while nine had operated for portions of 1958. There was a major realignment in mill operation to more effectively treat available ore at lower cost. Vanadium Corporation of America closed its high cost Naturita mill and enlarged its Durango mill. Union Carbide Nuclear Company closed its Rifle mill and opened its new Rifle milling complex designed to treat both ore and concentrates; the latter being shipped from Carbide Nuclear's upgrading mills at Green River, Utah, and Slick Rock, Colorado. For the first time, two mills treated non-Colorado Plateau type ore; they were Gunnison Mining Company's new 200-ton-per-day, acid-leach solvent-extraction mill, and

Cotter Corporation's 90-ton mill. Gunnison treats company mined ore, while Cotter is a custom mill treating a wide variety of Front Range primary ores.

Union Carbide continued to operate its 1,000-ton Uravan mill and 300-ton Maybell mill (through subsidiary, Trace Elements Company). Climax Uranium Company operated its 330-ton, acid-leach solvent-extraction mill at Grand Junction. Vanadium was again recovered at Grand Junction, Uravan, and Durango from Carnotite-type ores.

Molybdenum output from the Climax mine of American Metal Climax, Inc. was the lowest for several years because of a 2½-month strike. However, at year's-end, mine tonnage was ahead of schedule to meet anticipated higher demand in 1959. Early in the year, the new byproduct plant was placed in operation to treat 34,000 daily tons of molybdenum tailing and recover 0.03 percent WO_3 , 1.25 percent FeS_2 , and a trace of Sn. In the mine, work continued on sinking the new 18-foot-diameter round shaft from the Storke level to a depth of 600 feet.

Only two important base metal mines were in continuous operation during the year. The Gilman mine of the New Jersey Zinc Company maintained full three-shift operations and shipped an average of 4,500 tons of zinc concentrate, 600 of lead concentrate, and 3,000 tons of copper-silver ore per month. In the San Juan Mountains, Idarado Mining Company operated its Treasury Tunnel-Black Bear mines and 1,200-ton differential lead, zinc, and copper flotation mill at Pandora. A total of 382,100 tons of 0.08 ounce gold, 2.08 ounces silver, 2.07 percent lead, 3.48 zinc, and 0.72 copper were milled during year. Development work replaced mined ore. Emperius Mining Company closed its operations for the first time in 25 years because of low metal prices, but reopened in November on a part-time basis.

Beryl activity reached a new peak but production was down to 135 tons from 182 in 1957. In Laramie County, the American Beryl Corporation and Mineral Concentrates, Inc., each built 50-ton-per-day mills.

Wah Chang Corporation purchased thorite ores from Fremont and Custer County mines for gravity concentration at its Sugarloaf, Boulder County mill. Concentrates were shipped to an East Coast buyer.

Eastern

► Production at Grace Mine Gets Underway; New York Is No. 2 Zinc State

NEW YORK slipped to second place among zinc producing states in 1958 from its former position as the nation's leading source in 1957. The decline was accounted for by reducing the work week at the Balmat and Edward mines of St. Joseph Lead Company. Output of iron ore in New York dropped sharply in 1958 as three of the state's five iron ore mines were idle part of the year. The remaining two iron mines reported production every month. The reduced production of iron ore also accounted for a reduction in the output of titanium concentrate.

IN PENNSYLVANIA, the most significant event was the start of production at the Grace mine of Bethlehem Cornwall Corporation. This project, near Morgantown, was initiated several years ago to

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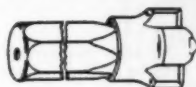
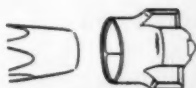
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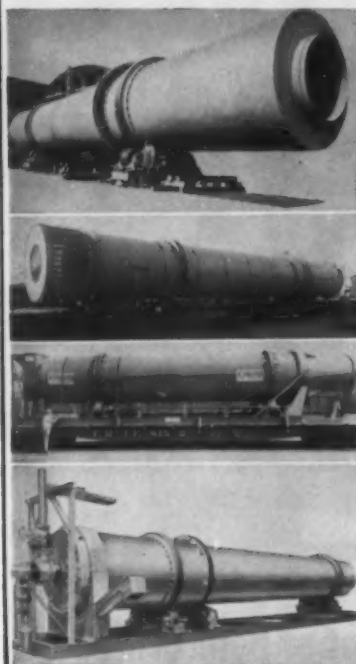
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develop a magnetic orebody. Development was planned around a block caving system. Two 3,000-foot shafts were required to open the orebody, which was originally scheduled for production at a much earlier date. Heavy water inflow during sinking, however, delayed completion of the project until 1958. Initial output was 800 to 1,000 tons of concentrate per day, and this required a mine feed of approximately 1,500 tons of ore and waste daily. When the mine is in full production, daily output will be from 10,000 to 12,000 tons. All surface structures except the concentrate agglomerating plant are completed. The latter will be completed this year. Important quantities of by-product cobalt are recovered from the Grace mine.

NEW JERSEY ZINC COMPANY undertook a major construction program at its Palmerton, Pennsylvania smelter. The new facilities will allow the company to materially increase its ore roasting capacity, and to expand production of sulphuric acid by over 40,000 tons per year. The additional capacity was required to handle ore and concentrate from new mines in Pennsylvania and Tennessee. New Jersey also reported that it had developed an efficient process for producing manganese-iron alloy (spiegeleisen) from ore recovered at its mines in Ogdensburg, New Jersey. The company reportedly plans to install a commercial size electric arc furnace for this new process, but a date for start of construction has not been decided. The company's mine at Friedensville, Pennsylvania operated for the first full year. It is reported to be one of the most modern in the world.

Another important development last year was the continuous copper cake casting unit installed at the Perth Amboy, New Jersey, refinery of American Smelting and Refining Company. The new process permits continuous casting of copper cakes up to 25 feet long by 36 inches wide.

Idaho

► A Poor Year in the Coeur d'Alenes; Possible Fertilizer Plant Planned

SILVER replaced lead as the most valuable mineral produced in Idaho in 1958. Production climbed for the third consecutive year to 15,565,000 ounces. Production increases at the Sunshine, Calena Crescent, Silver Summit, and Lucky Friday mines in the Coeur d'Alene district more than offset declines at Bunker Hill, Morning, and Day Mines in the same district and the Triumph mine in Blaine County. Sunshine Mining Company led all silver producers by a wide margin.

LEAD-ZINC output was down considerably because of depressed market conditions. Complete closure of the Bunker Hill Company's lead smelter and electrolytic zinc plant was narrowly averted at mid-year. Both facilities were operated on a 4-day work week much of the year. Near the close of 1958, the plants had returned to a 5-day work week schedule.

PHOSPHATE ROCK: One optimistic development of the year was the announced plans of The Bunker Hill Company for construction of a \$10,000,000 fertilizer plant, possibly at Kellogg. By-product sulphuric acid from the zinc plant would be used for conversion of the rock to fertilizer. Central Farmers Fertilizer

Company continued development and construction of mining, beneficiation, and electric reduction facilities for phosphate rock at Georgetown. This is a \$16,000,000 project with initial mining scheduled this month.

COBALT OPERATIONS at Calera Mining Company were reduced late in the year and emphasis was shifted to lower-cost, open-pit ore rather than high-cost, underground extraction. The company's contract with the government for purchase of metal ends in May 1959.

GOLD & MERCURY: Gold recovery was the highest since 1953. Calera Mining Company contributed a substantial increase to the state total. Holly Minerals Company resumed mercury production at its fire-damaged plant.

URANIUM EXPLORATION by Western Fluorite Corporation, Phillips Petroleum Company and Rare Metals Corporation of America resulted in Idaho's first substantial shipments of ore. The new field is in Custer County.

COLUMBIUM-TANTALUM minerals were recovered from alluvial sand deposits in Bear Valley by Porter Bros. Corporation. By-product uranium, thorium and rare earths are yielded from the concentrates of this operation.

CLAY BENEFICIATION: Construction of a beneficiation plant was started near Bovill by J. R. Simplot Company. The Anaconda Company continued to mine alumina clays from the same county to feed a 50 ton-per-day pilot plant at Anaconda. Purpose of the latter study is to determine economic feasibility of producing alumina from the clays.

EXPLORATION: Federal Uranium Corporation undertook a major deep de-

velopment program at the Conjecture silver mine at Lakeview. Shaft sinking to a depth of 1,000 feet is in progress.

TRANSACTION OF THE YEAR: Hecla Mining Company and Newmont Mining Corporation bought nearly \$5,000,000 worth of stock from stockholders of Lucky Friday Silver Lead Mines Company. Lucky Friday was one of the few producers of lead-silver in the state able to operate on a normal production schedule.

Lake Superior

► U.S. Iron Ore Firms Develop Foreign Sources; Copper Activity Declines

IRON ORE SHIPMENTS for 1958 from the Lake Superior District totalled 52,868,028 gross tons, compared to 84,615,871 gross tons for 1957. The 1958 figure is the lowest since 1939. Lack of steel demand late in 1957 was given as the major cause of the reduced production.

TACONITE concentrate shipments showed an increase over 1957 primarily because of the increase in shipments of pellets from Erie Mining Company's plant at Hoyt Lakes, Minnesota. Shipments of taconite concentrates from Taconite Harbor, Silver Bay, and the Duluth and Two Harbors docks of the Duluth, Missabe, and Iron Range Railroad exceeded 8,000,000 gross tons compared to nearly 6,000,000 gross tons in 1957.

DEVELOPMENT OF FOREIGN ORES by most Minnesota mining companies was experienced. United States Steel Corporation awarded several contracts toward completion of facilities at Quebec Cartier Mining Company. Iron Ore Company of Canada constructed pilot plant facilities at its Wabush Lake, Labrador deposits, and Pickands Mather & Co. is continuing research work on another deposit in the same district. M. A. Hanna Company acquired the controlling interest in the St. John Del Rey Mining Company in Brazil.

NEW BENEFICIATION FACILITIES placed in operation in 1958 include Steep Rock Iron Mines, Ltd.'s South Concentrator at Atikokan, Ontario, Canada. The North Concentrator will be completed for operation in early 1959. Oliver Iron Mining Division placed new heavy media facilities in operation at the Trout Lake concentrator at Coleraine, Minnesota.

Pickands Mather & Co. announced the closing of the Zenith Mine near Ely, Minnesota, early in the summer of 1958. This mine had been active since 1892 and had produced over 20,000,000 tons. Negotiations are underway by other mining interests to reopen this mine in 1959.

Late in 1958 contracts were awarded for construction of the Lind-Greenway concentrator facilities for Jones and Laughlin Steel Corporation near Grand Rapids, Minnesota. Jones and Laughlin also awarded a contract for revamping the Hill-Annex Concentrator at Calumet, Minnesota.

Cleveland-Cliffs Iron Company announced the expansion of the Humbolt

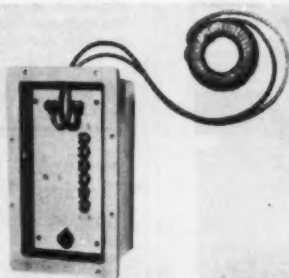
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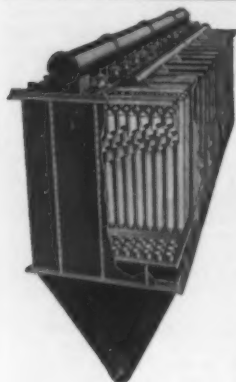
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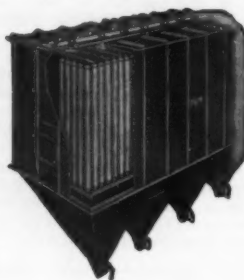
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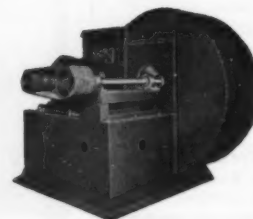
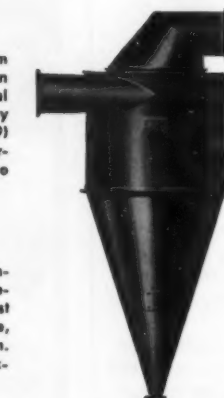


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Concentrator near Champion, Michigan. A contract was awarded for expansion of the flotation section of the plant and construction of an agglomerating section at the concentrator. Current plans indicate consideration of similar facilities at the Republic concentrator of the firm.

Jones and Laughlin and Wisconsin Mining Company continued exploration of the mineral reserves in Iron County, Wisconsin. Purchase of 300 acres of the land near Butternut, Wisconsin, was announced by Jones and Laughlin following geologic and graphical examination of the area, including diamond drilling. Initial operations at the Groveland mine of Hanna Coal and Ore Corporation near Iron Mountain, Michigan, were delayed until early 1959 because of the curtailed production schedule.

COPPER MINING operations in the upper peninsula of Michigan varied considerably because of the sharp drop in copper prices. White Pine Copper Company operated continuously through 1958, but Calumet and Hecla, Inc., Quincy Reclamation Company, and the Copper Range Company plant at Frieda, Michigan were closed down for varied periods of time. American Metals-Climax continued skeleton exploration near Ontonagon, Michigan. Bear Creek Mining Company late in 1958 applied to the State of Michigan for a lease on copper-bearing ores in Porcupine Mountain State Park near Silver City, Michigan. The request included lease on the ores under the South shore of Lake Superior adjacent to the Park. Due to public objection, however, Bear Creek withdrew the application in December 1958.

In summary of iron ore operations, it can again be concluded that foreign investments, both in South America, Labrador, and Quebec, appear to be the desire of American steel companies. Lake Superior District ores generally cannot compete with these ores from a quality standpoint, but new up-grading processes including magnetic reduction roasting, flotation, and direct reduction, may help make these ores competitive. Future development in Minnesota will depend largely on equitable taxation legislation.

Montana

► New Developments Are Shaping Up for Iron Ore, Chromite, and Aluminum

Production decreased at many of the well developed mines in the state. But future growth and stability of mining was enhanced by long-range investigations covering production of alumina from Idaho clays and production of high carbon ferrochrome (3 to 1 ratio). Prospects for development of an iron ore industry continued to brighten.

ALUMINUM output dipped in 1958

Please Turn To

Page 106 to check Minnesota, Michigan, and Wisconsin mine shipments of iron ore.

Page 201 for listing of tonnages mined at important U. S. open pit mines.

Page 202 to see the rank of the major underground U. S. mines.

because of poor market conditions. Anaconda Aluminum Company's 60,000-ton-per-year reduction plant at Hungry Horse depends on imported Caribbean alumina supplied under contract by Kaiser Aluminum & Chemical Corporation and Reynolds Metal Company. The Anaconda Company conducted research and investigation on the technical and economic feasibility of recovering alumina from clay. Over 7,500 tons of clay were stockpiled at a \$1,000,000 pilot plant at the reduction works at Anaconda, Montana.

COPPER: The Anaconda Company increased production toward the end of 1958 by working most of its operating mines on a 6-day basis. Previously the mines only worked on a five-day week. The Berkeley pit (copper), Kelley (underground-copper), and the Emma (underground-manganese) operated throughout the year. The Leonard (underground-copper) mine was closed during the early part of 1958, but the Mt. Con (underground-copper) was reopened during 1958. Production at the Anselmo (underground-zinc) was stopped for several weeks during the summer because of concentrator difficulties in Anaconda. A small open pit to mine zinc ore is being prepared at the old Alice mine. Ore handling facilities, including crushers, conveyors, and storage bins, at the Berkeley Pit were completed during 1958. The company carried out development work on a slusher train capable of negotiating short radius curves.

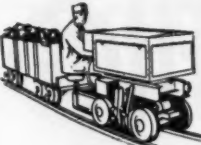


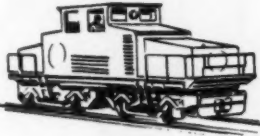
Chemical Copper Company of Three Forks, Montana produced cement copper from oxidized copper ore recovered from the old Copper City district. Mining is carried on by open-pit methods and the ore is processed on the property with cement copper as the end product. The crushed ore is agitated in a rotating leach tank from which it is carried along in a deep-troughed slow-moving conveyor belt where acid further leaches the ore. The copper in the pregnant-acid solution is recovered by replacement with scrap aluminum. This is a very neat operation of compact size for the tonnage handled.

IRON ORE development was featured by large-scale testing of 4,000 tons of ore mined at Minerals Engineering Company's Carter Creek deposit. This deposit is being extensively rotary and diamond drilled and may be developed by Minerals Engineering in cooperation with a Canadian firm. Ralls & Harris shipped 8,000 long tons of magnetite from the Iron Cross mine in Broadwater County. Young Montana Corporation shipped no ore during the year.

CHROMITE: A 5 ton-per-day pilot plant to produce high-carbon ferrochrome was completed and put into operation at American Chrome Company's Nye plant. Feed is gravity chromite concentrate recovered from the company's mine. American Chrome has fulfilled two-thirds of the total 900,000 tons called for under a Federal purchase contract. Research on production of ferrochrome under competitive market conditions is therefore timely and may help guarantee the company's future. One obstacle to be overcome is buyer resistance to the product, though it is said to be technically acceptable for use by the steel industry.

GOLD: Over 100,000 yards of gold-bearing stream gravel were excavated by a floating dredge on Prickly Pear Creek, near Jefferson City, by Lee and Ward Inc. of Bozeman. The dredge was reactivated at midyear after standing idle for nearly a decade. Output of gold in the state was at an all-time low and resulted

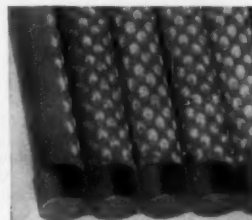
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largely from curtailed base metal mining.

MANGANESE: Final shipments were received in May at the Butte-Philipsburg depot for the government low-grade purchase program. The domestic producer carlot program is expected to terminate late in 1959. At the end of September 1958, 20,000,000 long-ton units had been received. The goal is 28,000,000 long-ton units.

LEAD-ZINC output was down in 1958. Silver Bow County supplied 70 percent of the states production.

NON-METALLICS: The Anaconda Company put a new \$1,500,000 ammonium phosphate fertilizer plant into operation at Anaconda. Production of phosphate rock increased. Montana Phosphate Products Company, Victor Chemical Works, and J. R. Simplot Company were the principal producers. Cummings-

Roberts completed the fifth consecutive year of increased output of high-grade fluorspar concentrate. The deposit is located near Darby, Montana, and is upgraded in a heavy media plant. Production of barite for drilling-mud by Baroid Sales Division, National Lead Company from crude ore mined near Greenough was about half the 1957 total.

Nevada

► A Promising Iron Ore Discovery and Non-Metallic Activity Are Highlights

COPPER: The most significant transaction of the year was the acquisition

by Kennecott Copper Corporation of the Nevada holdings of Consolidated Copper Mines Corporation for a reported \$8,400,000. The purchase was consummated to effect economies from consolidation of operations near Ely. The skip haulage system at the Liberty pit of Kennecott was scheduled for operation early in 1959. The unit is 1,360 long, inclined at 19°, and will hoist 25-ton skips. There is no immediate plan to complete a similar system at the Tripp pit, as planned by Consolidated Coppermines prior to the purchase.

During the year Kennecott mined out the Minnesota Hi underground orebody, but no stoping was done at the Deep Ruth deposit. The Minnesota Hi was discovered during development of the Deep Ruth for a caving project. Since the Minnesota Hi was above and partly within the expected cave area, production from the Deep Ruth was deferred until recovery was completed from the upper orebody.

Production of copper precipitate from the Anaconda Company's open pit mine and leaching plant at Weed Heights was slightly less than in 1957. The oxide zone of this mine is expected to supply ore for another 10 years at the present mining rate.

IRON: An extensive iron ore deposit estimated at 60,000,000 tons reportedly was discovered by geologists of the Southern Pacific Land Company in Buena Vista Valley, about 25 miles east of Lovelock. Southern Pacific engaged Bechtel Corporation to make an economic study regarding possible development of the deposit.

Two large shippers (Dodge Construction Company and Mineral Materials) and a number of smaller producers trucked iron ore to Colorado and Woolsey sidings on the Southern Pacific railroad near Lovelock. Most of the ore goes to Japan, but increasing amounts are being taken by Kaiser Steel Corporation at the Fontana, California plant. Uncertainty of contracts with Japan have plagued producers in the past. Reportedly some export trade has been lost to Canadian producers.

GOLD & SILVER: Nevada Porphyry Gold Mines, Inc. placer property, 45 miles north of Tonahap, was reactivated by Round Mountain Gold Dredging Corporation. Preparation of the property for production required removal of 2,000,000 yards of overburden by shovel and truck. Stripping and mining is carried out by Morrison-Knudsen Co. Inc. on a contract basis. First gold shipments were made in May. At the end of the year the plant was treating 13,000 cubic yards per day.

The Goldacres open-pit mine in Lander County (the only major lode mine) maintained normal production in 1958. At Silver Peak in Esmeralda County, United States Milling and Minerals Company operated the Bruhi mill on ores mined at nearby properties.

Bristol Silver Mines Company discovered what is believed to be a deep extension of silver-copper ore mined on upper levels. The new find looks promising. Operations, however, will be handicapped by the fact that the Garfield, Utah smelter will probably stop purchasing custom ores, necessitating the shipment of Bristol ore to Arizona.

NON-METALLICS: Eagle Picher Company placed a \$2,500,000 diatomaceous earth processing plant in operation near Lovelock. The facility was erected by Kaiser Engineers and includes a rotary kiln, blowers, cyclones, traps, and air heater. Capacity is about 36,000 tons of



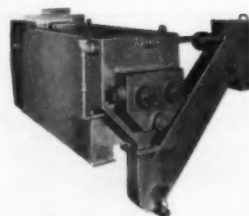
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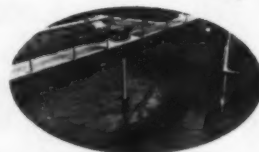
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natural and calcined filter aids annually. Ore is mined by open-pit methods from a large deposit 30 miles west of Lovelock. Fibreboard Paper Products Company is developing a new gypsum property in the Las Vegas area. Basic Inc. is engaged in a \$1,500,000 program to modernize and increase magnesite beneficiation facilities.

MANGANESE: Shipments of low-grade manganese were down in 1957 due to the closure of the Butte, Montana purchase depot. The Three Kids mine of Manganese Inc. was the biggest producer of ore and concentrate. Operation of the latter firm will probably continue through 1959.

MERCURY: Output in 1958 was 14 percent above 1957, but it was bolstered mainly by the government program which expired in December 1958. Nevada mercury mines now face a period of uncertainty.

MISCELLANEOUS: Standard Slag Co. and Apex Minerals, Inc. shipped uranium ore to out-of-state processing mills. Apex has plans for converting the Linka tungsten mill at Spencer Hot Springs to uranium ore processing subject to AEC approval. By the end of the year, all of Nevada's tungsten operations had ceased operations. Nevada-Massachusetts Co. was the last to close (in June 1958).

New Mexico

► Holds Uranium Lead as Four New Ambrosia Mills Start; New Discovery Reported by Anaconda

New Mexico's uranium producers completed a record year in 1958 as they brought four new mills into production at Ambrosia Lake. In order of completion, they were the 750-ton-per-day mill at Homestake-New Mexico Partners, the 1,500-ton Homestake-Sapin Partners Mill, the 1,725-ton mill of Phillips Petroleum Company, and the 3,630-ton Kermac Nuclear Fuels Corporation's mill. The latter, the largest in the United States, uses an acid leach and solvent extraction; the other three use a carbonate leach with caustic precipitation. Cost of these four mills was close to \$40,000,000.

The Anaconda Company operated its Bluewater 3,500-ton mill at capacity treating open-pit Jackpile mine ores. Jackpile stripping was continued well ahead of production. The discovery of another major ore body just west of the Jackpile was officially announced by Anaconda.

Shaft sinking and mine development continued at a rapid pace in Ambrosia Lake. Homestake's two operating companies, Phillips and Kermac, brought a number of mines into production. Several of the first mines in the district successfully overcame the initial mining problems caused by wet soupy ore, abrasive ore, and bad ground. Water continued to slow development of other properties, but as the year ended many operators were confident that all the water problems would be solved. Other exploration and mining problems on which much work remains to be done include dilution, ore grade control, grade and tonnage estimates, and mining of multi-horizon ore.

Rio de Oro Uranium Mines, Inc. and Calumet and Hecla, Inc. were both major uranium producers from their underground mines. New Mexico continued to

lead the nation in ore reserves, 52,800,000 tons, according to AEC calculation on June 30th.

Northern New Mexico became one of the nation's most important perlite districts with four crushing, screening, and/or grinding mills operating or under construction in the No Agua and Seven Hills districts. Great Lakes Carbon Corporation made first shipments from its 30-ton-per-hour mill; F. E. Schundler continued mining and milling; United Western Minerals Company's subsidiary, United Perlite Corporation, started construction on a 200-ton grinding plant; and United States Perlite Company started to build a plant.

Despite lower production and sales, potash continued as the most valuable mineral product in 1958. Six companies

were in production while Farm Chemical Resources Development Corporation finished its new shaft, the furthest north in the Calsbad district, and continued design studies for milling. Despite long vacations and decreased working time at major mines to bring production in line with demand, total output for the year was down only slightly, from 2,080,000 tons in 1957 to 2,011,000 tons of K₂O equivalent. Potash Company of America, Duval Sulphur and Potash Company, National Potash Company, Southwest Potash Company, International Minerals and Chemical Corporation, and United States Potash Division of United States Borax & Chemical Corporation were the producing firms.

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metal producer from the large open-pit mine. Operations were curtailed early in the year, but later a 7-day work week was resumed. Work on installation of an inclined skip hoist was started at the pit. An addition to the power plant was started with scheduled completion in mid-1959. Long range plans for more efficient mining, a new tailing dewatering system, and smelter improvements were drawn during 1958. Banner Mining Company continued development work at its Bonney mine and operated its mill to treat development ore during the latter part of the year. New Jersey Zinc Company closed its Empire Zinc Division at Hanover on May 1 because of low zinc price.

The year 1958 was the mill building year at Ambrosia Lake. With new mine development projects just started at year's end 1959 will be the first year of major mine production.

Oregon

► New Uranium Plant and a Reduction Facility for Aluminum Are Completed

Oregon's mineral industry in 1958 was marked by initial operation of a uranium ore processing plant near Lakeview and of an aluminum-reduction plant at The Dalles. The value of the state's mineral production declined less than 2 percent to \$42,118,000.

The uranium plant, in Lake County, started processing ore at the end of No-

vember. Built at a cost of \$2,600,000, it had a capacity of 210 tons of ore daily. The builder and operator, Lakeview Mining Company, was expected to supply most of the mill feed from the nearby White King and Lucky Lass mines.

Harvey Aluminum Company started production of aluminum at The Dalles early in August in a 240-pot plant with capacity of 100,000,000 pounds a year. Reynolds Metals Company curtailed operation of its Troutdale aluminum plant from May through October.

Oregon Metallurgical Corporation announced plans for a \$2,500,000 expansion of its Albany plant which makes zirconium and titanium ingot from sponge metal. Also at Albany, Wah Chang Corporation suspended zirconium production following expiration of a government contract but started making hafnium-free zirconium sponge in its own new plant. It also carried on columbium-tantalum reduction from Malayan columbite ore.

Open-pit mining of 1.5 percent nickel ore by Hanna Mining Company near Riddle, Douglas County, continued at about the 1957 rate and the affiliated Hanna Nickel Smelting Company produced ferronickel at about 2,000 tons-per-month.

Discontinuance of the federal chromite stockpiling program in May resulted in the shutdown of all the state's chromite mines after they had delivered 4,000 tons, valued at \$375,000, to the Grants Pass purchasing depot.

Production of mercury declined to 2,339 flasks or 41 percent from the 14-year high of 3,993 flasks in 1957. The Bretz mine, Malheur County, yielded more than half the total.

South Dakota

► Mines Development Inc. Increases Mill Capacity; Gold & Silver Hold Firm

Metal production in 1958 was relatively stable except for the uranium industry which decreased considerably. Output of gold declined slightly, but silver production increased 11 percent. Production of beryllium concentrates declined a little, and production of columbium-tantalum concentrates increased. Both are recovered as byproducts in mining of pegmatite deposits.

Homestake Mining Company, leading gold producer in the nation, increased its gold output during 1958, but silver production declined. At the Bald Mountain Mining Company, gold production declined 21 percent, and silver output was more than double that of 1957.

Uranium production during the year was mainly from Fall River County. It dropped 53 percent, compared with the previous year. Grade of ore mined, however increased from 0.17 percent to 0.23 percent U₃O₈.

Mines Development Inc.'s uranium mill at Edgemont operated throughout the year. In July a major modification was completed which included the addition of a water tower, first protection system, auxiliary buildings, and an Eluex system in the uranium recovery section.

A study by the AEC of uranium milling capacity in the various producing

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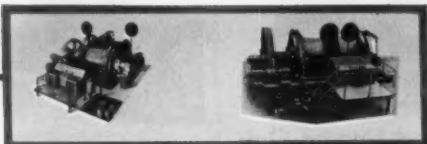
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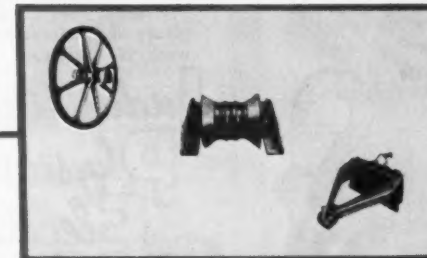
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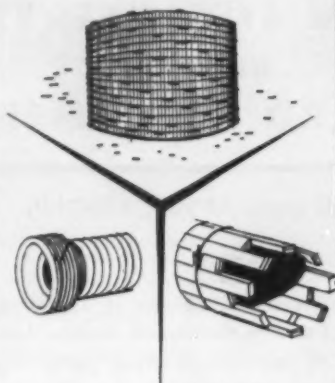
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areas of the state, resulted in a recommendation for a 600-ton-per-day plant to process the uraniferous lignites of North and South Dakota. International Resources Corporation then proposed to build such a mill, but this had not been acted upon at year's end.

International Minerals & Chemical Corporation's feldspar grinding plant at Custer was destroyed by fire during the summer. Rebuilding started in September and operation of the plant began in early December, although construction was not fully completed. Feldspar produced by the company, and by individual operators, was stockpiled at the plant site until the mill could process it. Production during the year was the same as in 1957.

Southeast

► Phosphate and Fluorite Output Show an Increase over 1957 Figures

The general slump in metals demand during 1958 had an adverse effect on mining in the southeast. The effect varied throughout the industry in relation to the general market and the strength of the individual companies. For example, there was only a slight drop in zinc mining in the southeast, but production of manganese ore was down 57 percent.

Production of some non-metals actually increased over the previous year. Phosphate mining, largely in Florida and Tennessee, increased by 500,000 tons. Fluorite mining turned upward with a 54 percent increase in tons mined.

Metal mining in general gave a very

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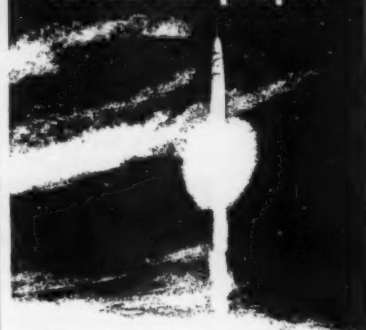
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poor accounting in relation to 1957. Heavy mineral production from Florida and Virginia had a very bad year, with recovery coming too late in 1958 to help the annual statistics. For the entire year, production of heavy mineral concentrates, principally titanium and zirconium, was off 66 percent.

Iron ore mining was on a very much reduced basis, too. Because of a lack of demand for iron and steel, most of the brown ore mines were shut down. Only the large steel companies, with their integrated facilities in the Birmingham, Alabama, area, were able to weather the slump.

In Virginia, New Jersey Zinc Company continued production of lead-zinc ore from the Ivanhoe and Austinville mines. The development program at Mineral, Virginia, was curtailed during the latter part of the year.

Tri-State Zinc Company, Timberville, Virginia, shut down its zinc mine in early 1958 because of the unfavorable zinc price. However, the company continued development of the mine.

Exploration activity in the southeast was even more restricted than mining. Most exploration was confined to extensions of known districts or working over abandoned areas with new techniques.

In North Carolina, Tennessee Copper Company was active in the Gold Hill district where copper and gold has been sporadically produced.

In Virginia, Bear Creek Mining Company drilled several holes on the Stony Point mine property near Stony Point, Albemarle County. Iron and copper ores have been produced from this mine. Appalachian Sulphides, Inc., Ore Knob, North Carolina, also ran several self-potential lines on the above property.

American Cyanamid Company, Piney River, Virginia, made magnetometer surveys of several properties in Amherst and Nelson counties, and core drilled at least one property in Amherst County, in search of additional nelsonite bodies. Nelsonite is a dike-like or lens-shaped body of rock containing abundant ilmenite, or rutile (or both) and apatite, with biotite, chlorite, and actinolite as gangue minerals.

Tennessee

► Zinc Industry Shows Strength and Output Edges Upward Slightly

Tennessee was one of only two bright spots in a generally gloomy picture of the U.S. zinc mining industry last year. While U.S. zinc production dropped some 25 percent—down from 532,000 to 403,000 tons—Tennessee's production edged up from 58,063 to 58,500 tons, a record output and second only to New York state in zinc production.

The only other state that experienced an increase was Utah, which mined 42,400 tons last year compared with 40,800 tons in 1957.

Tennessee's comparative strength in the zinc mining industry is attributed to three main factors: (1) The mining companies are large, integrated companies like New Jersey Zinc Company, who run more economical operations. (2) The East Tennessee ore bodies are amenable to low-cost mining operations. They are near the surface, close to markets, and yield a very pure metal. (3) Tennessee

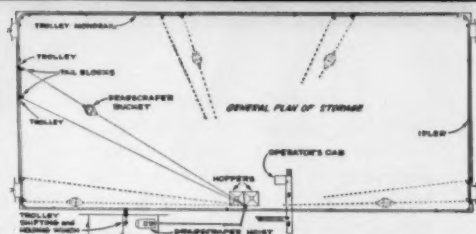
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INDOOR RECLAMATION DragScraper with Trolley and Monorail

—Material dropped onto stockpiles from an overhead conveyor is reclaimed to hoppers by a 2½-cu. yd. DragScraper.

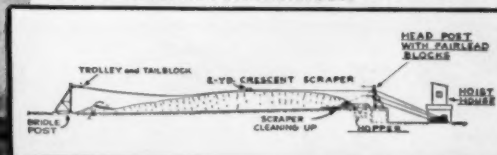
The installation uses a monorail and trolley system to permit shifting of the scraper bucket by remote control from operator's station at right. —Sauerman News No. 143.



OPEN STORAGE

DragScraper with Trolley and Elevated

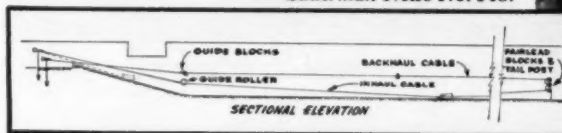
Bridle—DragScraper is reclaiming raw potash to hopper from storage pile. Material is dumped at rear of the pile and moved closer to hopper during intervals when mill requirements are satisfied. Trolley and tail block travel on an elevated bridle between two stiff-leg bridle posts. Shifting of the trolley is provided by a third drum on the Sauerman DragScraper Hoist—Sauerman News No. 146.



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DragScraper—Hot scale is dropped from ingot buggy track into tunnel and is conveyed by DragScraper to a water sluiceway for disposal. Safety is important here—personnel and vulnerable equipment do not enter the hazardous area.

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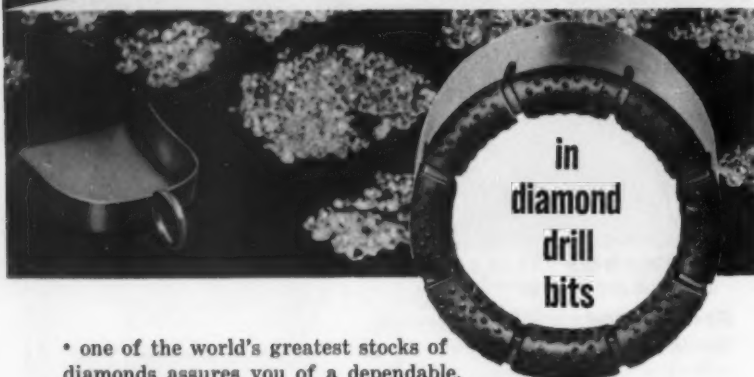
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mines, during the recent mining slump, stayed in operation in an effort to reduce losses from fixed costs that continue during shut-downs. This important decision left the Tennessee companies in an excellent position production-wise when metal prices began their upward climb.

New Jersey Zinc Company increased the production at its Jefferson City mine to 1,500 tons of ore daily. It's new mine at Treadway, in Hawkins County, was completely developed and ready to go into production on January 1st. American Zinc Company of Tennessee got its Coy mine at Jefferson City into limited production by the end of the year.

Many people in Tennessee's copper mining industry were saddened to learn that Tennessee Copper Company's famous Burra mine was exhausted. The mine, opened in 1899, produced 15,636,000 tons of ore. Among many firsts, the first electric power underground and the first back-filling to stabilize heavy ground was at Burra.

Other important changes occurred at Tennessee Copper's Copperhill, Tennessee operation. The consolidation of flotation operations at the London mill brought about a more efficient milling process. At Calloway mine, which is to replace lost production from Burra, the new hoisting shaft was completed late in the year. Other necessary installations are scheduled for completion so that regular production at this mine can be started by mid-1959.

In spite of a complete shut-down of Tennessee's two largest manganese mines and a 63 percent reduction in barite produced, the total dollar value of Tennessee's mineral production amounted to \$127,807,000. This was only one percent

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below 1956, the record year.

Exploration for zinc continued by three companies in the Mascot-Jefferson City and Copper Ridge districts, chiefly on projects under the D.M.E.A. program. Prospecting for barite continued in the Sweetwater area and in the Del Rio districts. It is reported that a vein of glass grade barite, five feet wide, was discovered by diamond drilling in the Del Rio district.

Tri-State

► Automatic Charging Machines Are Slated for the Henryetta Smelter

Mine production in the Tri-State District was estimated at 511,000 tons of lead-zinc ores in 1958. Recovery amounted to 15,066 tons of zinc concentrate containing 8,090 tons of zinc and 5,698 tons of lead concentrate yielding 4,070 tons of recoverable lead. Oklahoma accounted for 77 percent of the recoverable lead and 52 percent of the recoverable zinc. Kansas accounted for the remainder since there was no production from Southwest Missouri.

National Lead Company's St. Louis Smelting & Refining Division suspended operations indefinitely at the Ballard mine and mill near Baxter Springs, Kansas. At one time the mine was one of the most productive in the Tri-State district.

Eagle Picher Company suspended lead and zinc mining and milling operations at the Central Mill in Oklahoma in July 1958. The company's Henryetta retort zinc smelter was re-opened in December after a nine-month stoppage. Installation of automatic charging machines at this smelter will replace about 100 employees. Two other retort smelters were operated in Oklahoma in 1958. These included the Bartlesville smelter of National Zinc Company and the Blackwell smelter of American Metal Climax.

Utah

► Production Was Down but Year Was Marked by Several Efficiency Studies

COPPER MINING: Utah Copper Division, Kennecott Copper Corporation, continued work on an 18,000-foot haulage tunnel to connect the bottom of the Bingham Canyon open pit with railroad assembly yards at Copperton. In May of 1958 the tunnel had advanced to the 10,900-foot mark. The date for completion was estimated as March 1959. Utah Copper awarded a \$5,000,000 stripping contract to Western Contracting Corporation for the removal of 4,000,000 to 8,000,000 cubic yards of overburden from the upper levels of the east and west sides of the Bingham Canyon pit. This operation features two Marion 191-B electric shovels with 13-yard dipper. They are believed to be the largest shovels ever used in a Western copper mine. Another highlight of the stripping project is a 110-yard (heaped) end-dump truck designed by the contractor. The truck is powered by two, 430-horsepower, Cummins Diesel engines, and it is mounted on 5 axle assemblies (two pairs



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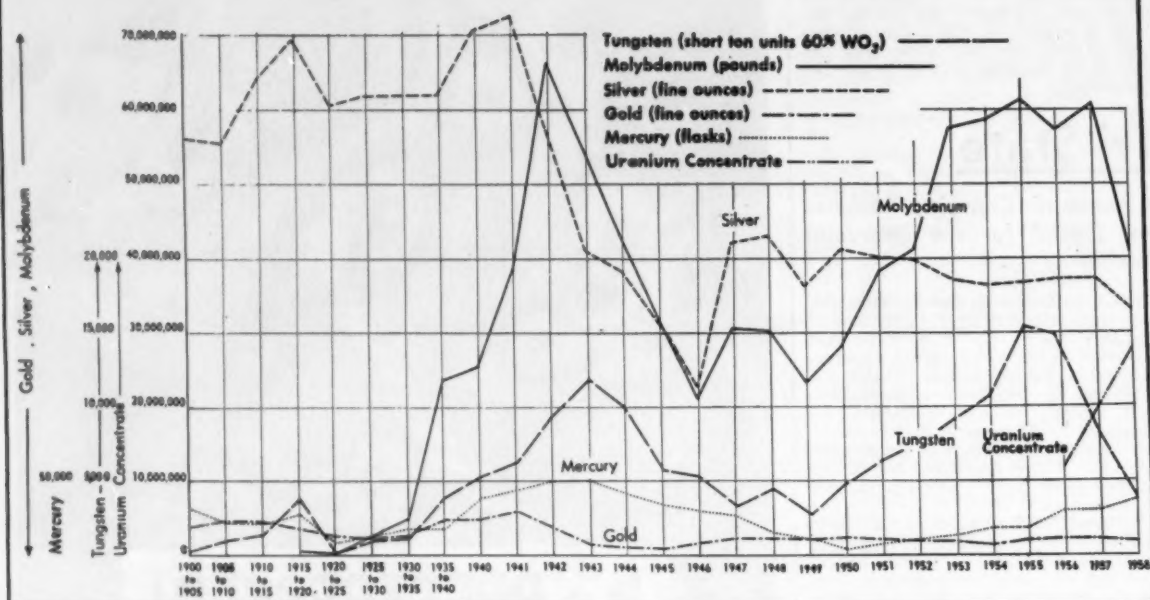
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U. S. MINE PRODUCTION OF KEY METALS FROM 1900 TO 1959



of tandem axles under the load). It has one telescoping, hydraulic hoist and is said to have a turning radius of 40 to 50 feet.

COPPER METALLURGY: Biggest news of the year was the sale of American Smelting & Refining Company's Garfield smelter to Utah Copper Division. ASARCO operated the smelter throughout 1958, and Kennecott took over management at the start of 1959. Utah copper instituted studies directed toward possible improvement of the smelter. Among proposals considered were: the discontinuance of roasting concentrates prior to matte smelting (a procedure that is standard at other Kennecott smelters); possible pumping of Arthur and Magna mill concentrates to the Garfield smelter by pipeline.

Tests on leach-precipitation-flotation of Utah Copper Division ores were conducted by Kennecott during 1958. Pyrite in mill tailings could be used for production of sponge iron which could also be used in place of scrap to precipitate copper leached from dumps. At the Arthur mill, an experimental rod mill was installed to study possible replacement of rolls, screens, and elevators.

URANIUM MINING: The only shipment to qualify for the \$10,000 bonus offered by the Atomic Energy Commission before April 11, 1958, was delivered by Lisbon Uranium Corporation from the Big Indian district near Moab. Uranium ore reserves in Utah were estimated by the AEC at mid-1958 as 5,100,000 tons containing 0.36 percent uranium oxide. Details of the longwalling method of mining the Radon orebody, using a German-made, yieldable, steel props were reported by Hecla Mining Company officials. The delivered cost of a prop is about \$70, but recovery is exceptionally high, and the application permits total recovery of the blanket-like deposit.

Another notable achievement was the

sinking of Shattuck Denn Company's Tom Bardon shaft in the Big Indian District. Over a 25-day period, the 7-by-14-foot vertical shaft was extended 392 feet for an average advance of 15.7 feet per day. For this project a folding, retractable jumbo mounting four Atlas air-leg drills was developed by Shaft and Development Machines, Inc., Machinery Center Inc. and Atlas Copco Pacific, Ltd. In a collapsed position, the jumbo will pass through a 48-inch opening. Other equipment developments employed at the shaft included at rectangular sinking bucket dumped in a manner similar to conventional production skips, and a 4,500-cubic-foot per-minute axivane fan mounted on the top deck of the Cryderman mucker. A metal vent tube extended through the cage to the operator's deck. The blower on the Cryderman was spotted above the suction line of the exhaust fan on the surface to reduce dead time following a blast (about 5 minutes in operation). Miners returned on visual observation of smoke-free conditions at the surface fan exhaust.

URANIUM MILLING: Union Carbide Nuclear Company completed construction of and began operating an upgrading plant at Green River. The flowsheet involved sand-slime separation of low-grade ore, followed by sand leaching. Precipitate from sand leaching was added to the slime and the entire product is dried and shipped to a uranium processing plant. Texas-Zinc Minerals Corporation operated its solvent extraction, 775 ton-per-day plant at Mexican Hat for the first full year. By-product copper is recovered by flotation at Texas-Zinc mill. At the end of the year Uranium Reduction Company was awaiting AEC approval for the installation of an alkaline circuit to its 1,500 ton-per-day mill at Moab.

PHOSPHATE: San Francisco Chemical Company shipped 6,000 tons of phos-

phate rock from a deposit near Vernal to its mill at Leefe, Wyoming. Purpose was to confirm laboratory scale tests of the feasibility of developing the huge Vernal deposits. The Garfield plant of Western Phosphates, Inc. was scheduled for a \$500,000 expansion program which would boost its consumption of phosphate rock by 10 percent. During 1958, United Heckathorn, Inc. began construction of a chemical plant at Garfield to remove fluorine from the phosphoric acid circuit of Western Phosphate, Inc. United Heckathorn will reportedly use the fluorine to produce artificial cryolite and other fluoride compounds.

POTASH: No announcement was forthcoming in 1958 regarding development of potash deposits in the Moab area. It is known that Delhi Taylor Oil Corporation has drilled a 17,000 acre property at Seven Mile and a 25,000 acre property at Cane Creek. The latter is reported to be the bigger and richer of the two. Marketing studies have been underway and the firm has obtained water rights and arranged for tailing disposal in the canyon of the Colorado River at Cane Creek. Plans for a \$20,000,000 project, including a beneficiation plant, have been rumored.

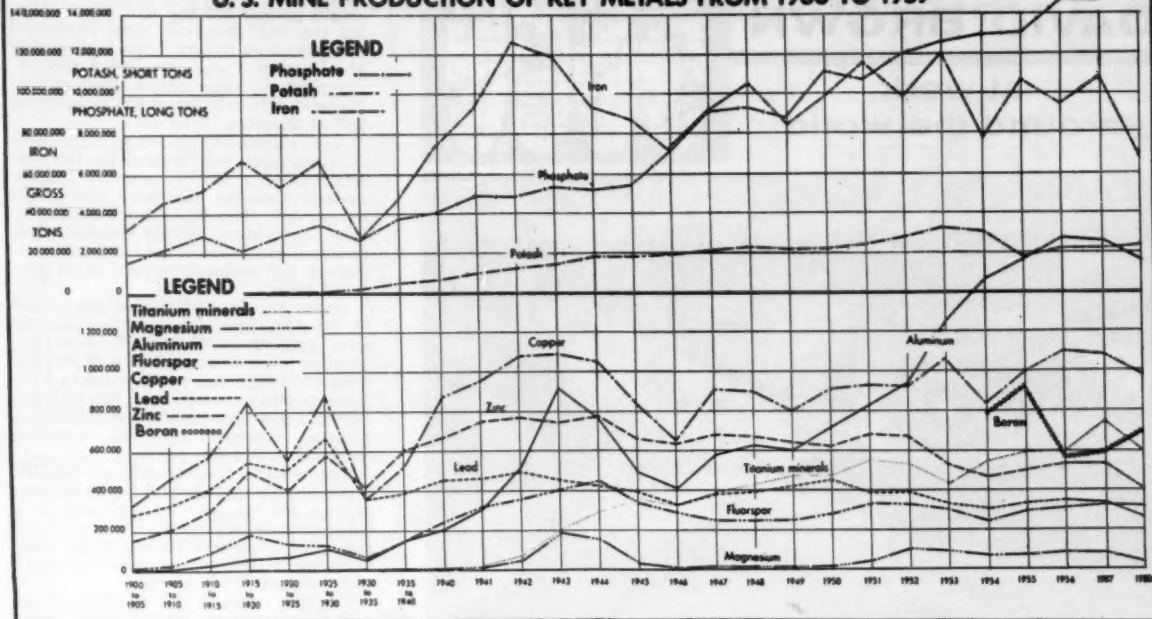
Washington

► Lead-zinc Mines Add to Ore Reserves; Iron Ore Production May Develop

In terms of dollar value, mineral production held up well during 1958. Sizeable gains in uranium, gold, and silver more than offset declines in output of other base metals and non-metals.

LEAD-ZINC: For the first time in

U. S. MINE PRODUCTION OF KEY METALS FROM 1900 TO 1959



years, production figures were unavailable. Fend Oreille Mines and Metals Company, the state's largest producer, put its operations in the Metaline District on a four-day week in February. Improved conditions led to a resumption of a 5-day work week in October. Drilling and underground work at Fend Oreille has indicated enough lead-zinc ore for a 10,000-ton-per-day plant. Current production is about 2,400 tons per day.

American Zinc, Lead and Smelting Company, second largest producer, curtailed production somewhat at its Grandview mine. Development of lower levels of the Grandview mine near Metaline Falls has indicated a larger tonnage of better grade lead-zinc ore than anticipated. The company sunk an offset shaft some 3,000 feet from the main working shaft to get additional depth on the ore zone. There was virtually no other base metal production in the state.

URANIUM: Dawn Mining Company, Newmont Mining Corporation subsidiary, maintained full-scale operation of its 440-ton-per-day uranium plant near Ford, Washington. The company mined more than 1,000 tons of ore daily from the Midnite mine and adjoining Boyd lease in the Spokane Indian Reservation. Silver Buckle Mining Company shipped ore to the mill from the former Northwest Uranium Mines' property on the reservation under a 60-ton-per-day contract. Four producers mined small quantities of uranium ore in the Mt. Spokane district for shipment to the Dawn mill. Two companies also made initial shipments from Fend Oreille County.

GOLD & SILVER: The two leading producers of gold, Lovitt Mining Company and Knob Hill Mines, Inc., experienced a year of uninterrupted production. Knob Hill also mined ore under agreement from the adjoining Gold Dollar mine of Day Mines, Inc. Opening of the Gold Dollar orebody at greater depth disclosed ore of much better quality and quantity. Surface plant improvements and shaft deepening were carried out at the Knob Hill mine. Daily ore shipments from

Lovitt Mining Company to the Tacoma smelter of American Smelting & Refining Company were valued for a high silica content as well as the gold content.

IRON ORE: The Buckhorn Mountain iron ore claims in Okanogan County were leased by two Canadian firms—Western Stevedoring Company, Ltd., and Pacific Quarries, Ltd. Small sample lots were shipped to Minnesota, Japan, the United Kingdom, and Canada. Plans were being made to ship iron concentrates to Japan through a bulk-loading terminal at Vancouver, British Columbia. Beneficiation would be carried out in Canada.

MERCURY & MANGANESE: Construction of a mercury plant was begun by Washington Mining Corporation in King County. A 40-ton-per-day furnace was installed to treat ore from two company mines. A mill site and crushing machinery were acquired by Inland Empire Mining Company for construction of a manganese concentrating plant at Port Angeles. Utilization of Olympic Peninsula manganese ore has been slowed by the high silica and iron content and the

fine dissemination of the manganese.

NON-METALLICS: Sunshine Mining Company reportedly concluded a contract with North Star Uranium, Inc., to develop a barite deposit 10 miles north of Colville. One possible market: rotary drilling mud in Alaskan oil fields. Output of magnesite from Northwest Magnesite Company, largest producer in the nation, declined. Slow demand by eastern steel mills was the primary cause.

Wyoming

► Tentative Expansion for Uranium and Phosphate Flotation Are Highlights

URANIUM milling capacity was slated for possible expansion with the announcement by the AEC that 1,770 additional tons of capacity would be allotted to the Gas Hills and Crooks Gap areas. This



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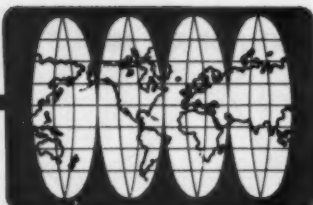
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would about double the capacity provided by the three mills now in operation, and would provide for two new plants. During the year two mills were completed and placed on stream. There were Lucky Mc Uranium Corporation's 825 ton-per-day plant, 50 miles east of Riverton, and Fremont Minerals, Inc.'s 550 ton-per-day mill at Riverton.

AEC permission, subject to approval of final contracts, was granted for the construction of a 522 ton-per-day mill by Federal Uranium Company and a 492 ton-per-day plant by Union Carbide Nuclear Corporation. Federal Uranium plans to install the Infilco continuous counter-current ion exchange system at its proposed plant.

Under the new allotments announced by the AEC, increases in milling capacity were granted to Western Nuclear Corporation (first in operation in Wyoming) from 440 to 825 tons per day; Lucky Mc's capacity was increased from 825 tons per day to 1,002 tons per day; and Fremont Minerals' treatment rate was expanded from 550 to 724 tons per day.

The Western Nuclear mill uses the RIP (resin-in-pulp) process and Lucky Mc employs a moving bed ion exchange in a column equipped circuit. Fremont's new mill, completed near the end of the year, is unique because it provides both acid and carbonate leach circuits.

Uranium reserves in Wyoming, estimated at mid-year by the AEC, were listed as 11,100,000 tons of 0.30 percent uranium oxide ore. At the end of 1957 the AEC estimated reserves as 9,200,000 tons of 0.26 percent uranium oxide ore.

ACID PLANT: Fremont Minerals Inc. started construction of a 125 ton-per-day contact sulphuric acid plant to supply its uranium mill and other uranium plants in Wyoming.

IRON ORE exploration and development by Columbia-Geneva Steel Division of United States Steel Company continued at the South Pass property near Atlantic City. Design of the proposed plant was turned over to Bechtel Corporation of San Francisco. During the year, Columbia-Geneva exercised options on mining claims and water rights.

Iron ore production came from three operations in the state in 1958. The Colorado Fuel and Iron Corporation operated the Sunrise mine and shipped hematite to its Pueblo, Colorado steel plant. Magnetite Products Corporation produced magnetite from the Cobar No. 1 mine for use in coating underwater pipe and transmission lines. Union Pacific Railroad Company shipped 16,000 tons of titaniferous iron ore from its Iron Mountain deposit to Combined Metals Reduction Company's Casleton mill near Pioche, Nevada. This shipment was to undergo direct reduction tests using the Krupp Renn process.

PHOSPHATE: San Francisco Chemical Company operated a 1,000 ton-per-day plant to upgrade phosphate rock for the first full year. This was the first plant to employ flotation of western phosphate ore, and represents a revolutionary approach to the western phosphate problem. The company is now constructing a Dorrco Fluosolids plant to make hydrocarbon-bearing phosphate rock usable for the fertilizer trade.

CLAY: Archer-Daniels-Midland Co. began construction of a clay processing plant at Colony to supply Minnesota's taconite industry with bentonite. About 25,000 acres of mining property is owned by the company, and a large stockpile of ore was available for initial operation of the mill. Bentonite is used as a binding agent for balling taconite concentrate.

Production of Minerals by States

California

Year	Iron Ore Long Tons	Chromite Tons	Mercury Flasks	Tungsten Tons (60% WO ₃)	Boron Minerals Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	60,293	13,419	25,714	2,603	301,282	1,408,793	2,154,188	3,943	3,464	440	\$52,231,066
1942	95,107	44,873	29,906	3,483	276,723	847,997	1,450,440	1,058	5,151	613	31,771,607
1943	794,440	62,495	33,812	3,871	256,633	148,328	609,075	8,762	5,820	1,856	9,176,616
1944	845,260	34,715	28,052	3,027	277,586	117,373	778,936	12,721	5,682	8,455	10,933,495
1945	280,573	9,607	21,199	1,073	325,935	147,938	986,798	6,473	7,224	9,923	11,152,081
1946	340,491	4,107	17,782	1,262	430,689	356,824	1,342,651	4,240	9,923	6,877	18,788,664
1947	530,434	948	17,165	394	301,935	431,415	1,597,442	2,407	10,080	5,415	21,769,620
1948	153,684	274	11,188	1,767	450,932	421,473	724,771	481	9,110	5,325	20,294,093
1949	536,525	433	4,493	952	467,592	417,231	783,880	649	10,318	7,209	20,616,562
1950	831,445	404	3,850	2,025	647,735	412,118	1,071,917	696	15,831	7,551	22,081,589
1951	1,198,847	6,302	4,282	3,007	862,797	339,732	1,145,219	921	13,967	9,602	21,700,575
1952	1,516,373	14,713	7,241	2,980	583,828	258,176	1,099,658	800	11,199	9,419	17,151,792
1953	1,697,652	26,512	9,290	2,130	715,228	234,591	1,036,072	382	8,664	5,358	12,870,230
1954	1,270,292	30,661	11,262	3,089	790,449	237,886	309,575	362	2,671	1,415	9,857,265
1955	1,776,536	22,105	9,875	4,383	924,496	251,737	954,181	613	8,265	6,836	14,276,301
1956	2,414,277	27,083	9,017	5,719	566,087	193,816	938,139	859	9,296	8,049	13,487,143
1957	—	34,901	16,511	1,750	585,545 ¹	170,885	522,288	945	3,458	2,969	—
1958 ²	—	20,500	21,600	(3)	694,000 ³	178,285	191,395	750	140	51	—

1. Reported as Bi₂O₃ content of ore; 2. Estimated by U. S. Bureau of Mines; 3. Figure withheld to avoid disclosure of company confidential data.

Idaho

Year	Phosphate Long Tons	Mercury Flasks	Tungsten Conc. 60 percent WO ₃ Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	97,274	NA	663	149,816	16,672,410	3,621	104,914	79,084	\$41,876,848
1942	115,263	NA	2,132	95,020	16,444,890	3,430	113,909	87,256	46,063,326
1943	108,916	4,261	4,878	30,808	11,700,180	2,324	96,457	86,707	43,199,910
1944	112,565	1,332	3,957	25,008	9,931,614	1,688	83,530	91,372	42,591,137
1945	123,340	627	2,130	17,780	8,142,667	1,548	68,447	83,463	37,799,975
1946	312,658	868	641	42,975	6,491,104	1,038	59,987	71,507	37,610,123
1947	845,045	886	61	64,982	10,345,779	1,640	78,944	83,069	55,164,670
1948	434,375	543	86	58,454	11,448,875	1,624	88,544	86,267	67,758,290
1949	471,305	—	66	77,829	10,049,257	1,438	79,299	76,555	56,429,796
1950	573,044	—	222	79,652	16,095,019	2,107	100,025	87,890	70,198,647
1951	695,026	357	377	45,064	14,753,023	2,160	100,025	78,121	70,953,653
1952	620,551	887	333	32,997	14,923,165	3,213	73,719	74,317	64,626,967
1953	1,001,969	NA	441	17,630	13,636,680	2,100	69,885	68,650	47,729,814
1954	1,092,817	—	450	13,245	15,867,414	4,828	69,302	61,528	49,951,702
1955	1,329,959	1,107	642	10,572	13,831,458	5,618	64,163	53,314	49,315,034
1956	1,438,151	3,394	582	9,210	13,471,916	6,656	64,321	49,561	51,949,222
1957	1,306,742	2,260	35	12,301	15,067,420	7,912	71,637	57,831	52,735,309
1958 ¹	1,379,700	2,800	—	14,700	15,565,000	9,600	52,400	46,900	41,821,000

1. Estimated by U. S. Bureau of Mines. NA Not available.

Montana

Year	Tungsten Conc. 60% WO ₃ Tons	Manganese ¹ 35% or More Mn Tons	Chromite ¹ Tons	Fluorspar Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	7	43,555	—	—	246,475	12,386,925	128,036	21,259	60,710	\$ 59,181,627
1942	—	120,409	65,238	—	146,892	11,188,118	141,194	20,050	54,715	60,129,853
1943	1	130,789	75,691	—	59,586	8,450,370	134,525	16,324	37,606	53,642,648
1944	25	153,665	1,251	—	50,021	7,093,215	118,190	13,105	36,127	49,039,855
1945	—	143,888	—	—	44,597	5,942,070	88,506	9,999	17,403	35,405,505
1946	4	123,490	—	—	70,507	3,273,140	58,481	8,280	16,770	29,957,206
1947	8	119,339	—	318	90,124	6,326,190	57,900	16,108	45,679	48,890,964
1948	—	107,399	—	422	73,091	6,930,716	58,252	18,411	59,095	56,422,609
1949	9	119,694	—	41	52,274	6,327,025	56,611	17,996	54,195	49,003,447
1950	—	91,080	—	—	51,764	6,590,747	54,478	19,617	67,678	54,956,689
1951	1	90,772	—	16,160	30,502	6,393,768	57,406	21,302	75,888	73,149,813
1952	14	113,429	26,089	5,932	24,161	6,138,185	61,948	21,279	82,185	70,521,092
1953	678	NA	NA	15,102	24,768	6,690,000	77,617	19,949	80,271	75,162,000
1954	1,211	106,026	118,703	25,223	28,123	6,080,390	81,542	17,028	68,588	89,264,689
1955	1,230	80,553	118,780	59,775	38,121	7,385,908	96,426	18,642	70,520	115,157,023
1956	661	68,298	119,149	64,339	32,766	5,558,228	91,512	13,300	50,520	76,791,951
1958 ²	—	65,000	125,000	NA	22,400	3,395,900	91,200	8,500	31,900	60,787,000

1. Gross weight short tons. 2. Estimated by U. S. Bureau Mines. NA—Not Available.

Nevada

Year	Iron Ore Long Tons	Manganese 35% or More Mn Tons*	Tungsten 60 Percent WO ₃ Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	241	2,937	2,289	366,403	5,830,238	78,911	9,263	15,129	\$38,959,420
1942	—	6,112	3,052	295,112	3,723,435	83,663	10,107	10,107	35,840,168
1943	7,368	10,451	2,910	144,442	1,620,280	71,068	4,790	13,647	28,531,601
1944	36,581	19,800	2,665	119,056	1,259,636	61,232	6,605	20,699	27,371,513
1945	6,196	874	1,857	92,265	1,043,380	52,595	6,275	21,457	24,186,294
1946	3,299	1,067	2,617	90,680	1,250,651	48,616	7,175	22,649	27,026,416
1947	5,452	67	2,002	89,063	1,337,579	49,603	7,161	16,970	31,366,282
1948	8,945	—	949	111,552	1,790,020	45,242	9,777	20,288	34,055,480
1949	3,094	—	740	90,399	1,800,209	38,058	10,626	20,443	29,615,777
1950	5,463	—	1,123	178,447	1,537,217	52,569	9,408	21,606	38,181,872
1951	331,327	58	1,482	127,036	981,669	56,474	7,148	17,443	41,280,596
1952	912,084	105	2,329	117,203	941,195	57,537	6,790	15,357	40,086,746
1953	444,081	20,510*	3,233	101,799	697,086	61,850	4,371	5,812	42,177,725
1954	351,250	88,220*	4,696	70,067	560,182	70,217	3,041	1,035	45,759,162
1955	324,602	102,000*	6,135	72,913	845,397	78,925	3,291	2,670	63,832,670
1956	916,592	121,482	5,400	68,040	933,716	80,824	6,384	7,488	78,154,038
1957	904,455	129,046	1,196	76,752	958,477	77,750	5,979	5,292	53,297,028
1958 ¹	567,000	124,000	50	98,300	936,600	65,300	4,200	65	39,910,170

1. Estimated by U. S. Bureau of Mines. *Long tons. 2. Shipments to Government low-grade depots and custom mills not included.

Colorado

Year	Molybde- num Pounds	Tungsten 60%WO ₃ Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	27,751,273	646	380,029	7,301,697	6,748	12,374	15,722	\$23,877,597
1942	41,852,136	380	268,627	3,096,211	1,102	15,181	32,215	19,896,623
1943	46,133,715	378	137,558	2,664,142	1,028	18,032	44,094	19,205,415
1944	23,608,421	296	111,455	2,248,830	1,048	17,698	39,995	17,724,473
1945	18,525,041	234	100,935	2,226,780	1,485	17,044	35,773	16,676,521
1946	10,816,426	213	142,613	2,340,151	1,754	17,036	36,147	19,903,509
1947	11,512,710	68	168,279	2,557,653	2,130	18,696	38,745	23,868,179
1948	13,172,094	208	154,802	3,011,011	2,298	25,143	45,164	30,155,337
1949	10,752,817	222	102,618	2,894,886	2,403	26,853	47,703	27,474,322
1950	11,903,043	196	130,390	3,492,278	3,141	27,007	45,776	29,323,268
1951	22,538,739	336	116,503	2,787,882	3,212	30,336	55,714	38,931,539
1952	23,874,408	623	124,594	2,813,643	3,606	30,066	53,203	35,997,231
1953	37,306,341	864	119,218	2,700,000	2,941	21,754	37,809	22,447,780
1954	42,544,795	927	96,146	3,417,072	4,523	17,823	35,150	21,602,205
1955	43,043,000	1,152	88,577	2,772,073	4,323	15,805	35,350	22,240,009
1956	37,489,000	873	97,668	2,284,701	4,228	19,858	40,246	26,342,138
1957	42,466,000	45	88,000	2,788,000	5,000	21,000	47,000	25,590,000
1958 ¹	30,000,000	N.A.	78,000	1,974,000	4,000	14,000	36,000	17,479,000
1956		Vanadium ²		5,582,484	Uranium Ore ³			
1957		Vanadium ²		6,264,000	Uranium Ore ³		740,000	
1958 ¹		Vanadium ²		N.A.	Uranium Ore ³		920,000	

1. Preliminary. U. S. Bureau Mines. 2. Pounds. 3. Short Tons.

New Mexico

Year	Potassium Sulfate K ₂ O Equivalent Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	433,677	27,845	1,328,317	73,478	4,668	37,862	\$25,471,416
1942	548,730	11,961	676,170	80,100	4,608	46,461	29,542,885
1943	604,414	5,563	463,583	76,163	5,723	59,524	34,042,378
1944	679,721	6,918	535,275	69,730	7,265	50,727	32,178,026
1945	733,176	5,604	465,127	56,571	7,662	40,295	26,386,781
1946	789,473	4,009	338,000	50,191	4,899	36,103	26,522,417
1947	880,605	3,146	515,833	60,205	6,383	44,103	28,374,769
1948	967,945	3,414	537,674	74,687	7,653	41,502	46,799,576
1949	932,497	3,249	380,855	55,388	4,652	29,346	31,029,120
1950	1,072,722	3,414	338,581	66,300	4,150	29,263	37,437,915
1951	1,217,717	3,950	443,267	73,558	5,846	45,419	54,697,048
1952	1,411,125	2,949	479,318	76,112	7,021	50,975	56,559,692
1953	1,562,823	2,614	338,000	72,477	2,943	13,373	45,725,959
1954	1,732,240	3,539	109,132	60,558	887	6	36,196,189
1955	1,826,118	1,917	251,072	66,417	3,296	15,277	54,581,760
1956	1,930,754	3,257	392,967	74,345	6,042	35,010	75,153,458
1957	2,080,000	3,000	309,000	67,000	5,000	33,000	50,106,000
1958 ¹	2,011,000	3,000	145,000	57,000	1,000	9,000	32,416,000

1. Estimated by U. S. Bureau Mines.

Utah

Year	Iron Ore Long Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	397,607	356,501	11,395,483	266,838	69,601	42,049	\$ 97,796,623
1942	359,558	391,544	10,374,953	306,691	71,930	45,543	113,552,848
1943	922,959	390,470	9,479,340	323,898	65,257	46,896	124,562,540
1944	1,542,284	344,223	7,593,075	282,575	52,519	38,994	111,036,247
1945	1,931,749	279,979	6,106,545	226,376	40,817	33,630	90,018,641
1946	1,317,176	178,533	4,118,453	114,284	30,711	28,292	60,202,627
1947	2,823,853	421,662	7,780,032	266,533	49,698	43,673	158,624,849
1948	3,233,413	368,422	8,045,329	227,007	55,590	41,490	149,763,677
1949	2,712,390	314,058	6,724,880	197,245	53,072	40,670	121,649,828
1950	5,139,926	457,551	7,083,808	218,630	47,753	31,678	150,415,431
1951	4,726,159	432,216	7,310,665	271,086	50,451	34,317	182,897,139
1952	4,060,003	435,507	7,194,199	282,894	50,210	32,947	185,780,497
1953	4,617,288	483,430	6,725,807	269,496	41,522	29,184	195,289,033
1954	3,040,646	403,401	6,179,243	211,835	44,972	34,031	164,367,236
1955	3,847,402	441,206	6,250,565	232,949	50,452	43,556	220,628,713
1956	4,001,734	416,031	6,572,041	250,604	49,555	42,374	260,693,260
1957	4,156,000	378,000	6,198,000	238,000	44,000	41,000	184,240,000
1958 ¹	5,468,000	300,000	5,010,000	185,000	39,000	42,000	131,270,000
1957		Uranium Ore		1,076,000 ²			
1958 ¹		Uranium Ore		1,245,000 ²			

1. Estimated by U. S. Bureau of Mines. 2. Short Tons.

Washington

Year	Tungsten* Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	68	84,176	402,030	8,686	3,903	13,320	\$ 7,874,886
1942	45	75,396	369,038	8,030	4,851	14,398	8,172,609
1943	4	65,244	370,440	7,365	5,022	12,203	7,838,012
1944	5	47,277	321,608	6,164	5,825	11,904	7,195,136
1945	2	57,860	281,444	5,281	3,802	11,693	7,140,242
1946	1	51,168	264,453	4,527	2,987	11,329	6,886,748
1947	—	34,965	291,736	2,240	9,359	13,800	7,513,398
1948	—	70,075	375,831	5,665	7,147	12,638	11,171,715
1949	—	71,994	357,853	5,275	6,417	10,740	9,613,307
1950	—	62,117	363,566	5,057	10,344	14,807	12,652,302
1951	9	67,405	344,948	4,089	8,002	18,189	14,030,884
1952	4	54,776	315,645	4,357	11,744	20,102	14,767,054
1953	5	62,560	321,000	3,740	11,064	32,786	15,067,000
1954	18	66,740	315,735	3,636	9,358	22,304	12,575,762
1955	12	74,360	3,958	10,340	29,536	16,297,361	
1956	—	70,669	448,442	2,926	11,657	25,600	16,043,542
1957	—	—	—	1,700	12,734	24,000	
1958 ¹	—	—	—	50	—	—	

1. Estimated by U. S. Bureau of Mines. *Tungsten (recoverable contents of ores) 60% WO₃
NA—Not available

Florida

Year	Phosphate Rock Long Tons	Titanium Minerals Tons
1950	8,085,870	(2)
1951	8,496,831	(2)
1952	8,781,125	(2)
1953	9,331,002	178,818
1954	10,437,297	182,421
1955	8,747,282	238,500
1956	11,822,145	283,956
1957	10,191,000	263,000
1958 ¹	10,577,000	187,000

1. Estimated by U. S. Bureau of Mines.

Michigan

Year	Copper Tons	Iron Ore Long Tons
1941	46,440	15,201,619
1942	45,679	16,129,474
1943	46,764	14,510,357
1944	42,421	15,425,788
1945	30,401	11,865,624
1946	21,663	8,756,802
1947	24,184	12,965,482
1948	27,777	12,896,478
1949	19,506	11,199,024
1950	25,608	12,691,101
1951	24,979	13,703,901
1952	21,699	11,779,366
1953	24,097	14,326,074
1954	23,593	9,709,167
1955	50,066	14,143,509
1956	61,526	12,536,009
1957	58,400	13,122,875
1958 ¹	59,500	8,150,000

1. Estimated by U.S. Bureau of Mines.

Minnesota

Year	Long Tons	Content %
1946	49,055,340	51.48
1947	62,436,102	50.99
1948	67,923,237	49.86
1949	55,943,714	50.25
1950	64,538,759	49.37
1951	78,164,527	50.53
1952	63,906,069	50.16
1953	80,533,670	50.31
1954	48,613,338	50.94
1955	69,419,334	50.65
1956	62,637,317	51.49
1957	67,656,040	52.49
1958 ¹	41,800,000	N.A.

1. Estimated by U. S. Bureau of Mines. NA—Not available.

New Jersey, New York, Pennsylvania*, and Virginia

	1957	1958 ¹
New Jersey		
Zinc ²	12,530	607
Iron ³	876,605	381,000
New York		
Silver ⁴	64	42
Lead ⁵	1,667	960
Zinc ²	64,659	53,475
Pennsylvania		
Cobalt ⁶	599,122	599,000
Virginia		
Manganese ²	12,655	9,400
Zinc ²	23,080	19,568
Lead ⁵	3,143	2,956

1. Estimated by U. S. Bureau of Mines. 2. Short tons. 3. Long tons. 4. Fine Ounces. 5. Pounds.

Wisconsin

Year	Iron Ore Long Tons	Lead Tons	Zinc Tons
1950	—	532	5,722
1951	1,745,120	1,391	15,754
1952	1,485,845	2,000	20,588
1953	1,655,331	2,094	16,830
1954	1,428,910	1,261	15,534
1955	1,886,029	1,948	18,826
1956	1,488,361	2,582	23,890
1957	1,576,057	1,900	21,375
1958 ¹	871,000	900	13,000

1. Estimated by U. S. Bureau of Mines

Kansas

Year	Lead Tons	Zinc Tons
1941	14,538	71,403
1942	9,419	55,874
1943	9,213	56,944
1944	9,394	63,703
1945	7,370	48,394
1946	6,445	47,703
1947	7,285	41,497
1948	8,386	35,577
1949	9,772	29,433
1950	9,487	27,176
1951	8,947	28,904
1952	5,916	25,482
1953	3,347	15,515
1954	4,035	19,110
1955	5,498	27,611
1956	7,635	28,665
1957	4,257	15,859
1958 ¹	920	3,910

1. Estimated by U. S. Bureau of Mines.

Missouri

Year	Lead Tons	Zinc Tons	Copper Tons	Silver Fine Ounces
1941	165,909	21,932	1,400	169,027
1942	199,548	36,394	1,300	69,106
1943	184,910	30,413	1,340	111,285
1944	174,683	36,626	3,302	92,243
1945	176,575	22,175	3,399	54,822
1946	139,112	22,234	1,857	69,401
1947	132,246	17,074	1,760	93,600
1948	102,288	6,463	2,370	114,187
1949	127,522	5,911	3,670	123,413
1950	134,626	8,189	2,282	236,273
1951	123,702	11,476	2,422	184,424
1952	126,245	13,986	2,656	517,432
1953	125,895	9,981	2,374	359,781
1954	125,250	5,210	1,925	352,971
1955	125,412	4,476	1,722	438,000
1956	123,783	4,380	1,800	295,111
1957	126,345	2,951	1,604	183,427
1958 ¹	115,000	360	1,250	210,000

1. Estimated by U. S. Bureau of Mines.

Oklahoma

Year	Lead Tons	Zinc Tons
1941	25,021	166,602
1942	22,806	146,510
1943	19,733	114,085
1944	13,944	91,449
1945	12,664	69,300
1946	13,697	69,552
1947	14,289	51,062
1948	16,918	43,821
1949	19,858	44,033
1950	20,724	46,739
1951	16,575	33,450
1952	15,137	54,916
1953	9,304	33,413
1954	14,204	43,171
1955	14,126	41,543
1956	12,350	27,515
1957	7,183	14,951
1958 ¹	3,150	4,180

1. Estimated by U. S. Bureau of Mines.

North Carolina

Year	Feldspar Long Tons	Tungsten Conc. (60% WO ₃) Tons
1950	183,027	1,088
1951	166,361	1,041
1952	240,364	1,254
1953	268,062	2,074
1954	230,744	2,338
1955	242,724	2,609
1956	255,637	2,732
1957	233,000	2,000
1958 ¹	241,000	NA

1. Estimated by U. S. Bureau of Mines. NA Not Available.

Wyoming

Mineral	1957	1958 ¹
Iron ²	736,000	576,000
Uranium ³	275,000	660,000

1. Estimated by U. S. Bureau of Mines
2. Long tons. 3. Short tons.

Alaska

Mineral	Quantity	Value	Quantity	Value	Quantity	Value
Chromite ¹	7,193	\$ 711,481	4,207	\$ 431,000		
Coal, bituminous ¹	726,801	6,373,976	842,338	7,296,000	732,000	\$ 6,350,000
Gold ²	209,296	7,325,360	215,467	7,341,000	215,000	7,500,000
Lead ³	1	314	9	3,000	1	(4)
Mercury ⁴	3,280	852,539	5,461	1,340,000	5,200	(4)
Sand and gravel ¹	5,955,103	5,879,799	6,096,000	5,799,000	4,100,000	5,000,000
Silver ⁵	28,360	25,667	28,862	26,000	28,000	26,000
Stone ¹	194,864	394,894	528,000	1,953,000	273,000	955,000
Undistributed ⁵		1,643,937		1,390,000		8,100,000
TOTAL		\$23,408,000		28,792,000		22,315,000

*Estimated. 1. Short tons. 2. Fine ounces. 3. Flasks. 4. Value included with undistributed gem stones and other minerals whose value must be concealed to avoid disclosing company incomes. 5. Includes platinum.

Arizona

Year	Molybdenum Pounds	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	NA	315,392	7,498,260	326,317	15,638	16,493	\$ 97,638,310
1942	"	253,651	7,064,467	393,387	14,772	18,522	114,525,600
1943	"	171,810	5,713,889	403,181	13,727	19,677	121,212,902
1944	"	112,162	4,394,039	358,303	16,707	29,077	113,094,806
1945	"	77,223	3,558,216	287,203	22,867	40,226	95,965,006
1946	"	79,024	3,268,765	289,223	23,930	43,665	114,986,254
1947	"	95,860	4,569,084	366,218	28,566	54,644	182,752,537
1948	"	109,487	4,837,740	375,121	29,899	54,478	196,207,948
1949	"	108,993	4,970,736	359,021	33,568	70,658	177,894,134
1950	"	118,313	5,325,441	403,301	26,383	60,480	201,033,694
1951	1,172,740	116,093	5,120,985	415,870	17,394	52,999	235,289,045
1952	2,022,832	112,355	4,701,330	395,719	16,520	47,143	220,686,278
1953	1,446,557	112,824	4,351,429	393,523	7,092	19,613	242,572,489
1954	1,538,088	114,809	4,298,811	377,927	8,385	21,461	237,818,952
1955	1,497,000	127,616	4,634,179	454,105	9,817	22,684	325,928,786
1956	2,392,000	146,110	5,179,185	505,908	11,999	25,580	453,270,137
1957	2,385,000	152,000	5,279,000	516,000	12,000	34,000	332,082,000
1958 ¹	2,222,000	146,000	4,669,000	489,000	12,000	28,000	277,166,000

*Estimated by U. S. Bureau of Mines. NA—Not available.

Oregon

Year	Nickel Tons ¹	Mercury Flasks	Chromite Tons	Gold Ounces	Silver Ounces	Dollar Value
1941		9,032	840	96,525	276,158	\$3,576,154
1942		6,936	2,683	46,233	87,376	1,680,289
1943		4,651	16,363	1,097	10,527	45,878
1944		3,159	7,818	1,369	20,243	62,310
1945		2,500	4,366	4,467	10,461	163,874
1946		1,326	NA	17,598	6,927	621,527
1947		1,185		18,979	30,379	691,758
1948		1,351	3,345	14,611	13,596	523,690
1949		1,167		16,226	12,195	578,947
1950		5		11,058	13,565	399,307
1951		1,177	754	7,927	6,218	283,073
1952		868	6,591	5,509	4,037	196,469
1953		648	6,216	8,250	6,930	295,022
1954	1,993	491	6,665	6,520	14,335	241,174
1955	4,181	1,056	5,341	1,708	8,815	67,758
1956	6,866	1,893	54,577	2,738	13,542	108,086
1957	12,276	3,993	7,900	3,381	15,924	132,747
1958 ¹	15,000	2,339	4,012	1,650	3,800	61,189

1. Estimated by U. S. Bureau of Mines. 2. Nickel content of ore.

South Dakota

Year	Feldspar (Crude) Long Tons	Beryllium Conc. Tons	Gold Ounces	Silver Ounces	Dollar Value
1941	59,015	151	600,637	170,771	\$21,143,732
1942	56,449	205	522,098	186,937	18,406,363
1943	70,913	238	106,444	35,886	3,751,059
1944	64,806	306	11,621	5,445	410,607
1945	68,374	38	55,948	26,564	1,977,070
1946	74,540	95	312,247	86,901	10,998,861
1947	58,959	70	407,194	111,684	14,359,766
1948	54,037	45	377,850	94,693	13,323,894
1949	32,272	69	464,650	109,383	16,363,011
1950	43,875	96	567,996	142,069	20,008,436
1951	48,559	138	458,101	139,590	16,159,871
1952	40,163	334	482,534	132,102	17,008,249
1953	50,601	392	534,987	138,642	18,850,023
1954	44,498	337	541,445	151,407	19,087,606
1955	42,164	294	529,865	154,092	19,109,068
1956	45,164	195	568,523	136,118	20,310,537
1957	41,000	268	568,000	135,000	20,007,000
1958 ¹	41,000	225	568,000	150,000	20,016,000

1. Estimated by U. S. Bureau of Mines.

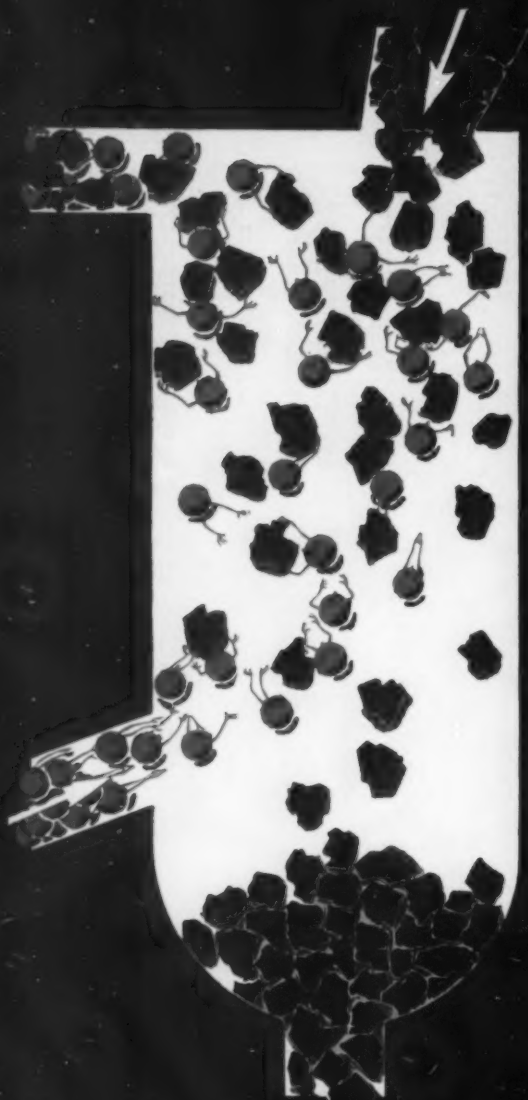
Tennessee

Year	Phosphate Rock Long Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1950	1,384,473	160	39,958	6,851	113	35,326	\$22,983,278
1951	1,419,892	108	24,960	7,069	14	38,639	28,121,644
1952	1,452,508	241	57,569	7,620	18	38,020	27,267,054
1953	1,622,170	293	68,935	7,829	9	38,465	25,666,924
1954	1,633,226	218	60,759	9,087		30,326	22,716,838
1955	1,465,902	221	66,619	9,911		40,216	27,881,089
1956	1,685,003	189	64,878	10,449	5	46,023	33,201,978
1957	1,812,000	172	54,407	9,790		58,063	31,933,000
1958 ¹	1,925,000	130	42,400	8,800		58,500	29,926,000

1. Estimated by U. S. Bureau of Mines.

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A Survey of WORLD-WIDE MINING

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LATIN AMERICA

Argentina

The year 1958 was one of transition for Argentina and its mineral industries. The new government made many economic changes and regulations which affected mining. Nevertheless, the government had an active exploration program underway by the Direccion Nacional de Minería. Exploration was made for gold, iron, silver, manganese, tungsten, tin, lead, zinc, barite, asbestos, and phosphate.

Regular exports of tungsten, borax, silver, beryl, lead, and zinc were made.

The Sominar Company, largest tungsten producer, cut output but continued development of La Asperenza (San Luis Province), San Virgilio and Bismutina (Cordoba Province) with plans for future erection of mills. The new Cerro Overo mill to treat sulphide ores was under construction in Mendoza Province.

There was a great deal of activity in borax mining, processing, and export. Borax production was about 70,000 tons, local consumption only 22,000, so a large tonnage was available for export including some to Iron Curtain countries. A new plant was established and another planned at Campo Quijano (Salta Province).

Exploration for and mining of uranium remained active. Ore was mined in La Rioja, San Sebastian, Santa Victoria, and Santa Brigida assaying from 1.0 to 25.0 percent U_3O_8 . In Mendoza Province ore was mined at the Soberania and Independencia mines, and in San Luis Province at the La Estela mine.

One of the most important exploration projects by the government was at Sierra Grande (Rio Negro Province) where 100,000,000 tons of hematite-magnetite were indicated.

Cia Minería Arguilar, S. A. the Argentinian subsidiary of St. Joseph Lead Company maintained regular production of lead and zinc ore.

Bolivia

The downward trend in mineral production in Bolivia continued in 1958. This was due to fewer miners, many workmen's strikes at mines, lack of new equipment, and even spare parts for old equipment, and decreased efficiency at operating mines.

Bolivia was given a tin export quota under the International Tin Agreement but this quota had only limited effect as mine output under the conditions described above limited production close to the quota. Lead production fell. In fact, Bolivia failed to fill its United States import quota.

In addition to lost production, the total operating time of 138 days lost by strikes cost the nation about \$120,000 per day as ever strike ended by paying miners their wages for the days the strikes were in effect.

The Corporación Minera de Bolivia continued to operate the larger mines; the independent miners were squeezed by tin quotas and regulations of the Banco Minero.

Leading tin mines were Catavi, Colquiri, Huanuni, Caracoles, Santa Jose, and Unifacado. Caracoles, Kaml, and Vilo were leading tungsten producers,

Corocoro of copper; Pulacayo and Animas Telemayo of zinc; and Tataci, Animas Telemayo, and Santa Jose of lead.

Tin exports by years were as follows in metric tons: 1958, 18,015; 1957, 28,242; 1956, 27,336; and 1955, 28,370.

Plans called for closing the Bolsa Negra, Kami, and Pulacayo mines early in 1959.

At year's end negotiations were underway for the United States to further finance Bolivian mines by bartering for 5,000 tons of tin concentrate.

Negotiations continued between Bolíver Exploration Company (Ventures, Ltd. and Vitro Corporation of America), and the Bolivian government for a large mineralized concession. However, no agreement was reached.

The brightest spot in Bolivia mining was gold. Independent miners continued placering, but with lower output at Tipuani. Messers. Bolinca continued exploration until late in the year when heavy rains interrupted activities.

Two United States companies: Natomas Company and South American Placers, Inc. a subsidiary of South American Gold & Platinum Company were active. Natomas prospected the Beni River down river from South America's ground. South American Placers dismantled a dredge in New Guinea, transported it to Bolivia by ship, railroad, truck, and air and was erecting it on Beni River bank in eastern Bolivia at year's end. Digging should start in 1960.

Brazil

Companhia Vale de Rio Doce, which exports almost 85 percent of all Brazilian iron ore, constructed special loading facilities for iron ore fines at its docks in Vitoria during 1958. Special ore cars were also ordered for the Vitoria-Minas Railway which carries the ore from mine to port.

A 12,000-ton-per-year lead smelter was completed at Santa Amaro near Sao Paulo, and another with an annual capacity of 8,400 tons was completed at Nova Iguaçu in the state of Rio de Janeiro. Production in 1959 is expected to total around 20,000 tons which will be close to the level of consumption.

Cia. Electroquímica S.A. brought a new aluminum plant into production during the year which is expected to bring the firm's annual output to 7,000 tons. The plant is located at Saramenha, Ouro Preto, Minas Gerais State. Cia. Alumínio do Brasil, which controls the firm, operates a plant at Alumínio, Sao Paulo. The bauxite for these plants comes from Pocos de Calda, Caldas, Araxá, and Ouro Preto, state of Minas Gerais' and Moji das Cruzes, state of Sao Paulo. In the Pocos de Caldas area, the reserves are estimated at 150,000,000 metric tons.

During 1958, Hanna Mining Company

acquired a substantial interest in St. John d'el Rey Mining Company which operates a Brazilian gold mine, and owns extensive iron-bearing deposits. Hanna then sent a management and geological team from the U.S. fully equipped to investigate the iron ore reserves and also look into the feasibility of continuing the gold mining operations.

Other U.S. companies also showed an interest in Brazil's mineral resources during 1958. Kennecott Copper Corporation organized a new exploration subsidiary called Kenrada Pesquisas Minerais, S.A. Wah Chang Corporation of New York, through its subsidiary Mineracao Wah-chang S.A., is now operating a tungsten mine and mill in Rio Grande do Norte province, and many other foreign countries are said to be interested in the promising area.

Kaiser Industries is reported to be considering a multi-million dollar investment in Brazil's steel and aluminum industries. A \$50,000 feasibility study was made to determine whether to erect an integrated steel mill in Sao Paulo, and a geographical investigation of bauxite deposits is also under way.

Eight Japanese firms formed a new company to furnish technical assistance and equipment to the Companhia Siderurgica de Minas Gerais. The company has been named Japao-Usiminas and it will help to finance and build a new steel plant at a cost of \$7,780,000.

British Guiana

Despite heavy borrowing (exceeding £1,000,000) from partners the British government controlled Colonial Development Corporation, and B.G. Consolidated Goldfields Ltd. were forced to close their two remaining dredges operating on the Potaro and Konawaruk rivers respectively on account of rising costs, and the failure of the Konawaruk dredge to work satisfactorily. Under these circumstances it is questionable whether the Konawaruk River—which has been dredged by another company many years ago—will be dredged again because values there are generally low. However, there are still considerable reserves of payable ground on the Potaro River bed and on the adjacent flats, and renewed activity in that locality can therefore be expected, probably by some other company in view of the fact that a hydroelectric power station has been successfully installed at B.G.C.G.'s main camp at Tumatumari. Another reason why attempts will probably be made to start dredging the remaining reserves in and along the Potaro River is that, over the years, the considerable native community, depending entirely on the activities of B.G.C.G. has gathered in and around Tumatumari.

Equally serious from the point of view of native welfare, and even more so from an economical angle was the curtailing of

British Guiana Mineral Exports and Value in 1955, 1956, 1957, and 1958¹

Commodity	1955		1956		1957		1958 ¹	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Bauxite								
Calced ²	252,330	£1,789,078	317,878	£2,322,163	287,130	£2,072,183	157,129	£1,190,976
Dried ³	1,916,891	3,374,956	1,789,765	3,789,326	1,734,064	4,077,656	984,695	2,301,892
Diamonds ⁴	33,227	280,342	30,871	277,841	28,455	283,685	23,715	216,986
Gold ⁴	13,204	171,983	6,224	82,676	7,699	103,897	9,646	129,897
Total Value:		£5,616,359		£6,472,006		£6,537,421		£3,839,751

1. First 10 months. 2. Metric tons. 3. Metric carats. 4. Troy ounces.

Latin America

operations by the Colony's largest mineral producer the ALCAN controlled Demerara Bauxite Co. which cut down production by over one-third because of the decrease in world demand for aluminum. This is the reason why 1958 exports and receipts took such a dip.

The production of diamonds is, traditionally, the occupation of 'Porknockers' the name given to native prospectors who seek the gems by using local ground knowledge and who win the stones by employing age-old methods of panning and sluicing. The British Guiana Diamond Mining Corporation, which is controlled by Canadian interests started to operate a hydraulic dredge in the Meamu River and the adjacent flats which cover some of the ancient river bed.

The method of hydraulic dredging (described in the 1957 MINING WORLD Catalog, Survey and Director Number) is still in its infancy, but it is noteworthy that the British firm Acrow (Engineers) Ltd., is now demonstrating a hydraulic dredge on the Great Ouse River at St. Ives at Huntingdonshire.

The manganese ventures referred to in last year's review have not, as yet, made any contribution to British Guiana's mineral exports and no news has come to hand concerning the activities of the two companies, viz: African Manganese Co. (Mine Management) Ltd., and North Western Guiana Co. Ltd., (a subsidiary of the Union Carbide & Carbon Corporation) which started to develop manganese deposits in the northwestern part of the Colony.

Chile

The mining industry in Chile almost maintained its 1957 level of production in 1958. The total value of copper, which is the mainstay of the Chilean economy, was down 3.4 percent from 1957. Chilean nitrates were down 5.5 but, the mineral which holds third ranking importance, iron, was up about 10 percent. The new conservative government which was voted into power in late 1958 is reputed to be a practical businessman's government and started out to prove it almost at once by increasing the value of the peso. This government promised the mining industry new life and hope by modifying or removing some of the restrictions which choked it in the past. The government also announced that it wants to stimulate the production of gold.

Copper is still Chile's most important mineral product. In 1958 another great copper producer was rapidly approaching production and will probably start in

Copper Production In Metric Tons By Sources and Types In Chile in 1957 and 1958

Source	1957	1958
Large Mining Companies		
Electrolytic	154,934	128,353
Refined	66,012	59,414
Blister	212,863	230,796
Sub Total	433,809	418,563
Small and Medium Mining Companies		
Electrolytic	0	90
Blister	15,820	20,631
Export minerals	4,223	2,248
Concentrates	24,277	20,699
Cement copper	3,409	3,456
Sub Total	47,729	47,124
Grand Total	481,538	465,687



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Latin America

April or May of 1959. This is Andes Copper Mining Company's El Salvador mine which will feed a new 25,000 ton mill. Other new mines in production in 1959 will be Mantos Blancos in the province of Antofagasta, owned by the Empresa Minera de Mantos Blancos S.A., which is installing a 1,000 ton concentrator, and Cia. Minera Tamaya S.A. opening several mines in the province of Aysen.

At Chuquicamata (Chile Exploration) a small plant for the recovery of molybdenum was installed and began to produce. Chuquicamata still continued to expand and passed the 150,000 ton mark in ore and waste removed in 24 hours.

The Japanese were very active in Chile in 1958 having bought the oxide copper deposit of Portezuelo near Antofagasta. The Caja Credito Minero's smelter at Paipote produced 19,940 tons of blister copper which was shipped from the port of Caldera to West Germany for electrolytic refining.

The primary producer and buyer of gold and silver is the Caja Credito Minero. The Cia. Minera Tamaya S.A. produced some at its mines in the province of Aysen and at the mine at Punataqui. Soc. Min. y Com. Sali Hochschild also purchases some gold and silver at its agency in Copiapó. Production of gold decreased and silver increased according to statistics of the Caja Credito Minero. Gold was down to 1,230,768 grams, and silver increased about 700 to a total of 8,948 kilograms.

Iron is rapidly becoming one of Chile's important mineral products. There continued to be three large producers while the Japanese firm, Mitsubishi Metal Mining Company, bought a large deposit near Copiapó. Several small producers were active, among these Cia. Sal. Antofagasta y Tarapaca, Cia. Minera Cominex, and others mined in the La Serena-Copiapó area. Cia. Minera Cerro Iman continued to ship. Production from the small mines amounted to less than 500,000 tons in 1958. In the past two years the Cia. Minera Santa Fe, with mines at Ovalle, Incahuasi, Copiapó and, Chañaral became the largest producer in Chile. In 1958 it shipped 1,597,282 tons of ore. Bethlehem (Chile) Iron Mining Company shipped 1,093,611 tons which represented a decrease of 9.5 percent from 1957. The Cia. Minera Santa Barbara rated third with 922,054 an increase of 21 percent over the year before. The Santa Barbara production record was improved with the introduction of new machinery and methods. Several new operations bear watching in the future; among them will be the Algarrobo mines. With the completion of mining and shipping facilities there in about two years scheduled annual production will probably be about 2,000,000 tons. Alfred Krupp of Germany has announced through his representative in Chile that his company plans to develop the large taconite deposit in the zone of Arauco, south of the city of Concepción. His plans call for installation of a Krupp-Renn direct reduction plant.

Chile is the most important producer of iodine in the world. Production is and always has been tightly controlled by the government formed Corp. de Ventas

de Salitre y Yodo. It is produced as an important byproduct of sodium nitrate. Sales of iodine were up 25 percent in 1958 over the previous year and production went up over 65 percent to 1,176,615 kilograms.

Work continued by Anglo-Lautaro on its nitrate chemical byproducts plant. No date has been set for the initial operation of the new system, but it is believed that it will start in 1959. Anglo-Lautaro increased production from 745,914 metric tons in 1957 to 980,638 in 1958. In 1958 a project was started to produce from a new salitre pampa called "Remiendos" a heretofore undeveloped type containing high trace element values. This is to be dry concentrated and used directly in order to retain its value. A production goal of 100,000 tons per year has been set.

The production of lead was almost totally carried out by the Caja Credito Minero. Zinc during 1958 was only produced by the Cia. Minera Tamaya, which produced 7,120 tons of lead, zinc, and silver concentrate at Puerto Cristales. Tamaya also produced over 3,000 tons of lead ingots. The Caja Credito Minero produced 232,676 kilograms of lead in 1958 and 339,815 the year before. The entire production of lead in ingot form by the Cia. Minera Tamaya is consumed in Chile. Concentrates are exported to Europe and other Latin American countries for smelting.

The mining of volcanic sulfur in northern Chile was limited to a few thousand tons in 1958. M. Hochschild continued to ship limited quantities as did Aconquilha from Antofagasta. The Cia. Azufera Nacional and Soc. Azufera Borlindo y Cia. produced mostly for agricultural use.

The government of Chile formed a controlled company to give a boost to the production of radioactive minerals. At year's end the only activity was by two United States AEC geologists on loan for two years to the Chilean government who had been in the field about six months. One or two important discoveries were made in the north at Sierra Gorda and Tocopilla. The new corporation will aid miners in production, technology, and in providing a steady market for uranium minerals. The company also announced plans for building a concentrator in the northern part of Chile.

Ecuador

Compania Industrial Minera Asociada S.A. (CIMA) made great efforts to strengthen its financial and economic status in 1958, and succeeded in increasing gold output from 16,832 ounces in 1957 to 19,311 ounces in 1958. Silver output was 47,599 ounces, 59,816 in 1957. Because the 62-year-old Portovelo mine is almost depleted, the company has been trying to increase production in the Ayapamba district by moving equipment from the old tunnels of Portovelo. Ayapamba has strengthened the hopes of the company with its promising mineral reserves found during the year. Some exploration will also

be undertaken in the Minas Nuevas district, which had been considered depleted; to determine whether some of the veins continue in depth. The company must also decide about moving the Portovelo mill, possibly to Buza in the north, which is equidistant between Ayapamba and Minas Nuevas. This would cut ore transportation by 7 kilometers.

Compania Minas Nacionales was engaged in important exploration activities during the year. In the La Plata sector of the Tachí River, in the western Andes, it has been examining the former operations of the American Cotopaxi Exploration Company. Along the Ecuadorian coast, the firm located an estimated 10,000,000 tons of black sand containing titanium and iron. A metallurgical plant to utilize the deposit is reportedly under consideration.

Donald Calvin Finlayson and James H. Wren have secured a permit from the government to explore and develop gold placer deposits on the Zamora and Nangarita rivers, Province Oriental Zamora-Chinchipe, covering a 150-kilometer area. The Rio Zamora district is a historic mining region which dates back to the gold producing Spanish colonies of the 15th Century, and the lost cities of Sevilla de El Oro.

Guatemala

The gross value of lead and zinc exported during 1958 was in the neighborhood of 3,000,000 quetzales. The mines employ about 800 people.

Compañia Minera de Guatemala, S. A. was forced to suspend mining operations in June, because of low metal prices, but continued its exploration program.

Compañia Minera de Huehuetenango, S. A. is still operating and exports about 500 tons of lead concentrate from its mines in northwest Huehuetenango.

Compañia Minera Occidental Ltd. mined and milled antimony ores in the Huehuetenango area.

Bunker Hill Company and W. R. Grace Company, under the name of Camagra are exploring the Torlon mine near the city of Huehuetenango. American Zinc, Lead and Smelting Company investigated a property in the Todos Santos area. Eagle Picher Company was exploring in Purulhá and Tactic in Alta Verapaz. Hanna Coal and Ore Corporation was active in exploration for nickel near Lake Izabal.

The Guatemalan government issues two types of exploration grants. One for a period of six months without the need to pay any surface tax (Decree 2000), and the second for a period of from three to five years, but with payment of a surface tax at a determined amount per hectare (Decree 272).

Low prices of metals, and import quotas imposed by the United States will undoubtedly depress present operations in Guatemala, and hold up, temporarily at least, any new operations contemplated by the companies now exploring.

Nicaragua

La Luz Mines Ltd. continued to operate as one of the western world's low-cost gold operations during 1958, but showed a reduced operating profit. Tonnage treated and grade of ore handled

Copper Production in Chile by the Anaconda Company and Kennecott Copper Corporation Mines in Pounds for 1955, 1956, 1957, and 1958

Mine	1955	1956	1957	1958
Anaconda (Chuquicamata)	461,482,227	532,008,343	540,195,146	427,136,000
Anaconda (Potrerillos)	84,699,879	86,330,173	87,437,221	65,870,000
Kennecott (Brdon)	309,942,000	347,826,000	339,024,483	344,856,000

both declined. For the 12 months ended September 30, 1958, the company milled 694,833 tons, compared with 701,877 tons in the same period of 1957, and produced 65,916 ounces of gold, compared with 75,676 ounces in 1957.

The firm had expected to bring its Rosita Mines copper property into production in late 1958, but operation is now scheduled for early 1959. A plant has been installed and a 100-mile road to tidewater has been completed. This road will also serve the Siuna gold property. A pier is being erected on the ocean near the mouth of the Principolka River.

La Luz is a subsidiary of the Canadian Ventures Ltd. organization.

able exports; silver replaced iron in third place by value.

Cerro de Pasco Corporation, by far the country's largest operator, slightly increased its output of lead, silver, and gold. The cadmium, selenium, and tellurium produced in Peru during the year were byproducts of Cerro de Pasco's mining and smelting operations. The company's custom smelting declined because of curtailment of smaller operations. Development of the Antamina copper property 100 miles northwest of Cerro de Pasco was temporarily suspended during the year. The work done at Antamina had disclosed about 12,000,000 tons of ore averaging 2.1 percent copper. These figures are not included in the firm's ore reserve

estimates because there is no intention of developing this deposit in the near future.

Development work is progressing on schedule at the Toquepala copper mine of Southern Peru Copper Corporation, and production is expected to start during the first half of 1960. Investment estimates have already been increased from the original \$200,000,000 to \$234,000,000. The 114-mile standard gauge railroad from the mill to the port of Ilo was completed and placed in operation in November. Well underway during the year was construction of the flotation mill with a capacity for treating 30,000 tons of ore per day, a smelter to handle 40,000 tons of concentrate per month, and a power plant with 45,000 kva capacity.

Venezuela

During 1958 the Venezuelan government's exploration parties discovered large deposits of bauxite and radioactive minerals. Iron ore production increased in contrast to many other countries where iron ore output declined. There were 30 new mineral concessions assigned as follows by the government: four mercury in Lara State, two for graphite and mica in Sucre state, one for sulphur in Sucre State, 10 for nickel and other minerals in Bolivar State, three for alluvial diamonds in Bolivar, two for alluvial gold in Bolivar, six for iron in Anzoategui State, and one for manganese in Bolivar. Plans for 1959 call for continuing exploration and mineral prospecting.

Evaluation of the Cerro San Isidro iron deposits in Bolivar was started by the government. Bids were called for drilling, topographical and geological mapping.

Recent discoveries of bauxite are promising so the government has reserved a national aluminum mineral zone. However, to encourage development two year exclusive exploration permits covering the reserved zones were made available calling for initial production within three years and local refining of ore mined.

Mining in 1959 should be intensified after the new Law of Mines is passed by the National Congress. Provisions are favorable for both foreign and domestic mining investors.

Metal and Mineral Production In Venezuela in 1957 and 1958

Commodity	1957	1958
Asbestos ¹	7,611	8,303
Diamond ²	122,598	89,565
Phosphate ^{1,3}	148,584	N.A.
Iron ⁴	15,295,543	15,484,543
Manganese ^{1,4}	29,882	8,200
Nickel ^{1,5}	1,487	2,002
Gold ⁶	2,788,562	2,364,129
Pyrite ^{1,7}	59,210	14,140

1. Metric tons. 2. Metric carats. 3. 30.3 percent P₂O₅. N.A. Not available. 4. 38.2 percent manganese. 5. 1.9 percent nickel. 6. Grams. 7. 25.20 percent sulphur and 2.2 copper.

Peru

Volume of mineral exports by the Peruvian mining industry in 1958 showed little change from 1957; however, dollar value declined, in line with lower metal prices. Actually, more lead, copper, silver, tungsten, cadmium, mercury, tin, gold, tellurium, molybdenum, and selenium were exported than during 1957. Lead and copper were the two most valu-



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Latin America

Production of Metals By Cerro De Pasco Corporation in 1957 and 1958

Metal or Concentrate	1957		Total	1958		Total
	From Cerro Ores	From Purchased Ores		From Cerro Ores	From Purchased Ores	
Copper ¹	33,810	11,535	45,345	32,745	8,695	41,441
Lead ¹	25,198	50,700	75,898	30,895	39,741	70,637
Zinc ¹	32,589	—	32,589	32,045	—	32,045
Silver ²	4,900,000	7,835,000	12,735,000	4,939,000	6,711,000	11,650,000
Gold ²	29,000	13,000	42,000	31,000	14,000	45,000
Zinc Concentrate ²	138,030	2,890	140,920	137,731	344	138,075

1. Short tons. 2. Fine ounces.

Peruvian Metal and Mineral Exports In Metric Tons and Dollar Values For 1957 and 1958¹

Commodity	1957 Production	1957 Value	1958 Production	1958 Value
Iron	2,179,000	\$23,494,000	1,424,000	\$16,600,000
Zinc	150,000	16,398,000	137,000	11,763,000
Lead	120,000	28,798,000	135,000	24,397,000
Copper	49,000	24,985,000	52,000	22,328,000
Manganese	4,200	341,000	2,000	180,000
Antimony	780	284,000	580	119,000
Silver	684.4	18,789,000	764.1	20,677,000
Tungsten ²	490	2,433,000	530	2,575,000
Bismuth	340	1,503,000	350	1,508,000
Cadmium	19	69,000	50	172,000
Mercury	14	79,000	59	315,000
Tin	12	25,000	15	30,000
Gold	2.30	2,435,000	2.46	2,585,000
Tellurium	0	0	4.1	15,000
Molybdenum	0	0	3.6	2,500
Selenium	2.4	41,000	4.2	48,000

1. Exports are later than actual production, but difference is not significant. In 1958 local iron ore was used for steel making. 2. As WO₃.

The port facilities, townsite, warehouses, housing, offices, repair shops, and accessory facilities at the mine had been completed by year's end.

Marcona Mining Corporation made plans for undertaking a \$25,500,000 construction and expansion program at its iron ore property near the Port of San Juan. With the aid of a \$10,000,000 credit from the Export-Import Bank, the firm will erect facilities for upgrading its ore. During the year, Marcona started shipping to the Chimbote steel plant of Corporación Peruana del Santa which was just going into large-scale production. Marcona had agreed in its original contract with Corporación Peruana to make these shipments to Chimbote when desired.

Another large-scale iron ore project got underway in 1958. This was at the Acari deposits south of Lima, being developed by Compania Explotadora de Hierro de Acari. Wells Overseas Ltd. received the contract for construction work and development of the mine, as well as construction of an airport and highway. The latter two items are now completed. Frederick Snare Corporation is building the new pier at the Port of San Juan, and Hewitt-Robins Inc. is designing and constructing a conveyor system for the pier. First ore shipments are expected in the middle of 1959 at an initial rate of 1,000,000 tons per annum. Over 10,000,000 tons of reserves have been proven.

The Santander mine of Cia. Minerales Santander Inc. went into production during 1958. The Santander firm is actually owned by St. Joseph Lead Company and Heller-Rosenshine interests who have spent about \$1,800,000 in development work. The ore runs about 12 percent zinc, 2½ percent lead, 0.5 percent copper, and 3 ounces silver per ton, although the surface ore, which will be mined by stripping during the first year, is expected to average higher.

Cia. Minera Condor S.A. planned to place its Condor No. 2 mine in operation late in 1958, but difficulties were encountered in construction of a mile-long conveyor from the mine to the flotation mill. This property has about 40,000 tons of

gold, silver, and copper ore proved, and geological conditions indicate even greater reserves are present. Monthly production is expected to be about 750 metric tons containing 26 percent copper, 10 ounces silver, and 0.12 ounce gold per short ton.

During the year, Consolidated Guayana Mines was reorganized and is now known as Latin American Mines Ltd. The Chavin mine was placed on a standby basis until metal prices improve. Reserves at the Chavin property, developed on four levels, are estimated to be 301,000 tons averaging 8.3 percent lead, 11.4 percent zinc, 1.0 percent copper, and 4.0 ounces silver per ton. The company's Tintaya copper prospect, where exploration results have been good, was also placed on standby basis, while an option on the Tapo nickel prospect was dropped.

Because of the discovery of uranium ore in La Convencion Province, Department of Cuzco, the government restricted mineral filing and declared that no further mining claims would be granted in the province.

Mexico

The year 1958 recorded an all-time high production for Mexican iron and sulphur. Silver, lead, and zinc held up very well under the low lead-zinc prices. The biggest drop for the year was in copper output.

Mine Production of Metals and Minerals in Metric Tons in Mexico in 1954, 1955, 1956, 1957, and 1958

Commodity	1954	1955	1956	1957	1958
Gold	12,203	11,526	11,287	18,569	10,838
Silver	1,247,207	1,461,791	1,363,803	1,486,974	1,484,430
Copper	52,006	52,245	52,924	91,191	68,097
Lead	211,681	211,211	204,406	209,744	198,913
Zinc	198,106	274,581	250,270	244,238	226,151
Iron	305,448	442,050	502,729	566,945	574,502
Manganese	79,561	37,078	487,608	791,253	692,255
Antimony	3,885	3,807	3,853	5,145	2,770
Mercury	506	1,040	726	695	823
Graphite	20,435	33,412	30,766	23,488	19,610
Tungsten	431	370	236	155	3
Arsenic	2,722	2,976	2,436	4,654	2,727
Sulphur ¹	N.A. ²	500,000	775,000	1,000,000	1,225,000

1. Estimated. 2. Not Available.

More than 1,200,000 tons of sulphur were produced by Mexican operations in 1958, and about 2,000,000 tons are estimated for 1960. Domestic consumption is only about 7 percent of current output. A large share of the exported sulphur goes to the United States.

The largest proportion of the Mexican sulphur production comes from the three U.S. companies using the Frasch process. These are the Mexican subsidiaries of Gulf Sulphur Corporation, Pan American Sulphur Company, and Texas Gulf Sulphur Company. A fourth Frasch producer will be the Texas International Sulphur Company, which has completed its Frasch facilities at the Texistepic dome, but has not yet gone into production. Negotiations between Texas International and Duval Sulphur & Potash Company did not culminate in any positive action. The two Mexican sulphur producers, Petroleos Mexicanos and Negociacion Minera de Azufre, are not yet able to supply the domestic market which is expanding rapidly and is currently at a level of 100,000 tons.

The Fresnillo Company is sinking its new Fortuna shaft from surface near present workings in the state of Chihuahua. The 3,000-foot shaft is expected to speed exploration of that part of the lead-zinc zone which is now difficult to reach through existing shafts. As of June 30, 1958, sulphide ore reserves in the Fresnillo, Plateros, and Naica mines were estimated at 5,786,300 tons.

The Board of Irreplaceable Natural Resources, which had been created by the Federal Government in 1957, continued to investigate and evaluate the nation's mineral resources. The Board has established the existence of previously unknown deposits of manganese, iron, and tin. Manganese reserves are now estimated at 7,240,000 tons, as compared with 1,500,000 in 1946. Exploration in the state of Zacatecas has established a reserve of 113,000 tons of tin ore. Total iron reserves are now set at close to 450,000,000 tons.

During the year, Altos Hornos de Mexico was reported to have purchased the Perla iron ore mine from La Consolidada steel mills at a cost of \$2,000,000. The Perla is about 115 miles from Altos Hornos' large steel mill at Monclava. A railroad is to be built from mine to mill at a cost of about \$4,800,000. The new ore supply source is said to be higher in grade than the present ore source which is Cerro de Mercado in Durango state.

M. W. Kellogg Company, world-wide licensing agent for the HyL sponge iron process, was awarded a contract by Fierro Esponja in Monterrey to engineer and construct a second plant. The present plant produces 200 long tons of sponge iron per day; the new plant would have a capacity of 500 tons per day.

Australia

For most producers of metals, 1958 was a year of hesitation. The great Broken Hill silver-lead-zinc mines reduced output; rutile and zircon yields from the East Coast beaches were sharply curtailed; the new ilmenite industry in the southwest of the continent struggled for survival; while, at year's end, the tungsten mining industry was virtually extinct. The Mount Isa area and other parts of northern Australia provided highlights in a sombre canvas. Projects underway at the beginning of the year were pushed ahead in lead-zinc and copper mining, uranium production, and development of bauxite deposits.

As in other countries, the disappearance of easy markets led to an emergence of further controls. A qualified gold subsidy has operated for some years and a bounty is now paid, under certain conditions, on primary copper sold on the domestic market. Tariff enquiries were held into antimony and sulphur (pyrite); it is anticipated that use of indigenous raw materials will be supported. Near the end of the year, minimum lead and zinc prices were quoted by the supplying companies for metal sold in Australia. Tentative attempts to fix a minimum export price for rutile were initiated by some producers without apparent success.

Tasmania

The closure of King Island Scheelite Ltd., Grassy, King Island, was a serious blow to the mining industry during August. The mine will reopen if tungsten prices show sufficient recovery. Aberfoyle Tin N.L., Rossarden tin-tungsten producer, continued working and will operate the nearby Storey's Creek mine as well. The Storey's Creek lodes are capable of appreciably expanded output.

Delineation of the Savage River iron ore deposits, on the western side of the island, indicate a large body of ore. A subsidiary company of Rio Tinto Ltd. is associated with the State Mines Department in this work.

Refined zinc output by The Electrolytic Zinc Co. of Australasia Ltd., Risdon, which draws the larger part of its concentrate from mines near Rosebery, was a record 115,000 tons. No real marketing difficulties were encountered.

Copper production by The Mount Lyell Mining and Railway Co. Ltd., Queentown was about constant at 10,500 tons of cathodes. Reserves of low grade ore are sufficient for an indefinite period ahead while some 300,000 tons of 5.0 percent ore have also been proved recently. The Mount Lyell Co. has taken a large interest in Renison Associated Tin

Mines N.L., North Dundas and virtually assumes responsibility for a five-year development program on the large, low grade ore body.

New South Wales

Contrasting with expansion in Queensland, many mining companies in this state were forced, by circumstances, to curtail production. However, output as a whole was unfavorable only by contrast with recent record years. The future is undoubtedly sound. Sharpest cutbacks were in rutile and zircon. The near future for rutile remains clouded; zircon production is associated with that of rutile and a condition of shortage may develop because of restricted rutile output.

The four lead-zinc producers at Broken Hill decided to reduce output as a contribution to world marketing conditions. Reductions in metals produced have not been great as somewhat richer ores have been mined in some cases. Part of the mines' zinc concentrate output was, however, stockpiled at Broken Hill.

Victoria

A few small gold mines were the only significant metal mines in the state. Western Mining Corporation Ltd. continued with its evaluation of gold deposits near Stawell. Some interest attached to a copper discovery in the northeast of Victoria but insufficient data are available to indicate whether a worthwhile deposit may be uncovered.

Queensland

Mount Isa Mines Ltd., Mount Isa, was constantly in the news with continued expansion of lead-zinc and copper mining activities with attendant power generation facilities, water conservation, and transport problems. Copper production rate is now over 40,000 tons annually; lead exceeds 60,000 tons. Zinc concentrate was being stockpiled at the mine. Further additions to all classes of ore reserve continue to be made. The subsidiary company's refinery at Townsville (Copper Refineries Pty. Ltd.) will be in operation soon after this report appears.

Milling commenced at Mary Kathleen Uranium Ltd., Mary Kathleen, during June. The first shipment of uranium oxide from this mine to the U.K. Atomic Energy Authority left Australia at the end of October.

Exploration of bauxite deposits on Cape York Peninsula continued vigorously. Ultimate expenditures of the order of £250,000,000 are visualised for complete development of this and related fields.

Mount Morgan Ltd., Mount Morgan, entered a better zone in its ore body and showed higher production and profit. The company continues to hope for a bounty which will encourage sulphuric acid manufacturers to use its pyrites.

Northern Territory

Uranium production, on a small scale, will shortly "come of age" as a result of contracts signed with the U.K. Atomic Energy Authority. United Uranium N.L. and South Alligator Uranium N.L. in the South Alligator River field have both been given the green light to produce oxide for a limited number of years at a fixed, but undisclosed, price. Rum Jungle continues as a producer although two open pit mines were worked out—the original White's find and Dyson's. Stockpiled ore from these bodies will keep the treatment plant occupied for five years while the value of other deposits in the vicinity is determined.

The treatment plant of Peko Mines N.L., Tennant Creek, did not work at capacity (now about 38,000 tons of concentrate, or 10,000 tons of copper per year). Marketing difficulties, plus profit limiting conditions in the Commonwealth copper bounty decision, do not warrant full scale output.

Bauxite deposits at Gove and on islands in the Gulf of Carpentaria were the subject of several reports during the year but appear to be of less interest than the Weipa (Q.) discoveries.

Early hopes of important tin fields at Maranboy and Mount Harris have not materialised in the form of proven deposits of economic value. Further work is to be undertaken in both areas but prospecting and development of most of Australia's tropical mineral deposits are hampered by climate and lack of large scale capital.

Western Australia

Gold production, the backbone of the State's mineral industry, was almost stable at 80 percent of the Commonwealth total. Output from individual mines varied somewhat, declines at some, such as the famous Hill 50 Gold Mine N.L., Mount Magnet, being compensated by increased output elsewhere.

The ilmenite industry in the southwest, which has a capacity of about 300,000 tons, accounted for only 80,000 tons production. Capacity will be still further increased in the coming year. Producers believe, or hope, that present marketing difficulties will be short-lived. This expectation appears confirmed by the opinions of overseas manufacturers of titanium white.

A number of possibly important prospecting campaigns continued or were initiated during 1958. Liberalisation of the Mining Act was an encouraging factor. United States names such as Reynolds and Union Carbide engaged in a search for aluminium and manganese respectively. Rio Tinto appears to have more general prospecting interests while the Australian company, Western Mining Corporation Ltd. extended its search for gold to copper, bauxite, and coal. Deep drilling for an extension to Kalgoorlie's Golden Mile was deferred pending receipt of further drilling equipment.

Australian Mine Production of Metals From 1952 Through 1958

Metal	1952	1953	1954	1955	1956	1957	1958 ¹
Gold ²	980,000	1,075,200	1,117,742	1,049,039	1,029,821	1,083,941	1,080,000
Silver ²	11,278,400	12,539,200	13,827,038	14,555,412	14,586,197	15,739,439	15,400,000
Copper ²	18,578	36,383	41,236	46,165	53,706	57,180	65,500
Lead ²	228,196	269,344	284,862	295,944	299,485	333,264	310,000
Zinc	196,450	239,324	252,659	256,564	278,082	291,582	262,879
Tungsten ³ , WO ₃ Content	1,282	1,116	1,100	1,170	1,220	1,090	850
Tin ³	1,611	1,553	2,075	2,017	2,078	1,952	2,150
Rutile concentrates ⁴	38,861	38,039	44,659	59,613	96,327	128,903	80,000
Zircon concentrates ⁴	N.A.	27,207	41,453	48,683	72,458	88,561	55,000
Iron ore	N.A.	3,298,718	3,518,804	3,572,609	3,923,985	3,805,473	4,050,000
Sulphur ⁴	N.A.	N.A.	N.A.	N.A.	N.A.	264,000	265,000

1. Estimated. 2. Fine ounces. 3. Long tons. 4. Recoverable sulphur content of zinc, lead, and pyrite concentrates.

South Australia

Refined lead output from The Broken Hill Associated Smelters Ltd., Port Pirie, was some 8,000 tons lower than 1957 due to mining cutbacks at Broken Hill (192,000 tons in 1958).

A decision by The Broken Hill Proprietary Co. Ltd., the nation-wide iron and steel producer to establish a steel industry at Whyalla was widely regarded as a victory for the State government. Work is expected to commence within a year. Meanwhile, The B.H.P. holdings of iron ore reserves have been increased and research is being undertaken on undoubtedly large taconite deposits in the Middleback Ranges. These developments and others, such as the Tasmanian discoveries (see above) appear to indicate that former fears of an Australian iron ore shortage within 100 years may prove ill-founded.

Republic of the Philippines

World-wide recession during 1958 hit the Republic of the Philippines mining industry with base metal production registering a wide drop in value as well as in quantity. Gold production, however, recovered to regain its top position as the country's number one mineral product in point of value as buying of gold continued active by holders of "blocked pesos." The

price for gold in the Manila market rose to as high as 147 pesos, equivalent to US\$73.50 per ounce, compared with the high of 123 pesos reached in 1957.

Development of the nickel laterites on several islands in the southern Philippines was delayed as there were no bids submitted by mine operators during the public bidding held by the Philippine government more than a year ago. The law opening the deposits to private capital for operation has been amended to give more favorable terms to operators. The government is now preparing to call a new public bidding on the operation of the deposits which cover an area of more than 6,000 acres.

Philippine gold production increased over 1957 by 11 percent to a total of 422,833 ounces, the highest since 1953. Production in 1958 came from 12 mines, including four copper mines which produced gold as a byproduct. Production is expected to show another increase during 1959 with one other mine scheduled to

resume operations in April or May. A new 300-ton mill at the Suyoc mine of Itogon-Suyoc Mines, Inc., was being completed and was expected to start trial runs at the end of March.

Benguet Consolidated, Inc., which owns 64½ percent of the stock of Balatoc Mining Company, acquired the mining property of Balatoc in May. Benguet produced 192,500 ounces of gold, accounting for 45.5 percent of the country's total output. With Balatoc production from January to May, total output of the two mines amounted to 232,405 ounces from 1,169,937 tons of ore milled, compared with 219,100 ounces from 1,107,855 tons of ore in 1957.

Surigao Consolidated Mining Company, which resumed normal mill operations after the disastrous fires in its underground workings in 1956 and 1957, produced 36,086 ounces from 84,978 tons of ore, compared with 17,870 ounces recovered from 54,309 tons of ore in 1957.

Itogon-Suyoc Mines, Inc., showed a

Production of Metals and Ores in the Philippine Islands for the Years 1951, 1952, 1953, 1954, 1955, 1956, 1957, and 1958¹

Commodity	1951	1952	1953	1954	1955	1956	1957	1958 ¹
Gold ²	393,602	469,408	480,625	416,052	419,112	406,163	379,982	422,833
Silver ²	274,602	693,751	572,046	502,069	N.A.	541,168	479,216	497,987
Chromite ³								
Metallurgical	32,736	52,364	88,541	62,595	59,745	127,370	113,358	34,489
Refractory	301,835	491,150	468,549	388,590	535,262	581,685	612,158	381,821
Iron ore ³	903,282	1,170,153	1,217,864	1,424,898	1,432,712	1,440,232	1,346,363	1,098,732
Copper ³	12,712	13,264	12,715	14,349	17,461	26,963	40,382	47,030
Manganese ore ³	22,343	20,627	21,508	9,393	11,912	4,414	30,231	22,308
Lead ³	571	2,300	2,434	1,827	2,318	2,140	814	1,284
Zinc ³	155	1,596	747	—	—	950	302	—
Mercury ⁴	—	—	—	—	635	3,015	3,363	3,321

1. From Philippine Bureau of Mines. 2. Fine ounces. 3. Metric tons. 4. Flasks (76 pounds).

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slight drop in production although there was a gain in quantity of ore milled. The mine produced 30,996 ounces of gold from 215,917 tons of ore, compared with the total of 31,505 ounces from 191,091 tons of ore produced in 1957. With the completion of the new Suyoc mill, the company should increase its production during 1959.

Baguio Gold Mining Company produced 29,732 ounces from 139,636 tons of ore milled, compared with 29,370 ounces recovered from 136,257 tons of ore treated in 1957.

The Masara gold mine of Samar Mining Company produced 15,536 ounces from 81,856 tons of ore, compared with 15,560 ounces from 80,258 tons of ore milled in 1957.

Paracale Gumaus Consolidated Mining Company increased the tonnage of ore milled to 69,165 and recovered 11,950 ounces of gold, compared with 58,374 tons of ore treated in 1957 with a recovery of 8,509 ounces.

Benguet Exploration, Inc., recovered 4,993 ounces of gold from 10,298 tons of ore, compared with the 1957 total of 2,224 ounces from 3,793 tons of ore milled.

Four copper mines recovered a total of 61,135 ounces of gold as a byproduct. In 1957 two mines produced 55,844 ounces of gold from copper operation. Atlas Consolidated Mining and Development Corporation recovered 9,957 ounces as against 10,518 ounces in 1957, while Lepanto Consolidated Mining Company produced 47,038 ounces, compared with 45,326 ounces in 1957. Philex Mining Corporation, which started operations in July, recovered 3,296 ounces of gold, and Hixbar Mining Company produced 844 ounces during one month of operation.

Copper is the only base metal of economic significance to the country which showed an increase both in quantity and value during 1958. Two copper mines were shut down but the outlook looks promising. Total production in 1958 amounted to 47,030 metric tons of estimated copper content of ores and concentrates produced, compared with 40,382 tons in 1957. In value, production in 1958 amounted to 49,000,000 pesos as against the value of 46,900,000 pesos in 1957.

The Toledo copper mine of Atlas Consolidated produced 18,827 tons, compared with 17,273 tons in 1957. The Toledo mill treated 15,000 tons of ore a day except when shortage of water occurred during the dry season.

Lepanto Consolidated Mining Company produced 13,053 tons, compared with 12,991 tons in 1957. Philex Mining Corporation produced 462 tons but is expected to show increased output during 1959 when the mill is expected to operate at full capacity of 2,000 tons of ore a day.

Sipalay Copper mine, owned by Marinduque Iron Mines Agents, Inc., registered a big gain with the mill running at full capacity during 1958. Production totalled 8,248 tons, compared with the previous total of 2,281 tons. The Bagacay copper mine, also owned by Marinduque, shipped high-grade ore with an estimated copper content of 5,029 tons, compared with 5,364 tons produced in 1957.

Normally, the Philippines supplies some 80 percent of United States annual requirements of refractory grade chromite, but reduced steel production and slack demand in Japan was reflected in lower output in 1958, in spite of increased shipments to Europe. Shipments of refractory chromite dropped by 37.6 percent to 381,821 metric tons from 612,158 in 1957. Exports of metallurgical chromite dropped by 69.6

percent to 34,489 tons from 113,358 tons in 1957.

Consolidated Mines, Inc., shipped all the refractory grade in 1958. Shipments included 28,350 tons of "fines," classified as plus-10-mesh, and minus-10-mesh concentrates which did not have any market prior to 1957. More than half of the shipments went to Great Britain and the balance to the United States, Japan, Belgium, and The Netherlands. In 1957, shipments of "fines" amounted to only 11,421 tons.

Acoje Mining Company, the largest producer of metallurgical grade chromite, shipped only 30,930 metric tons in 1958 as against 96,158 in 1957.

The export market for iron ore continued to be limited, with Japan as the only foreign outlet. While the Japanese are developing other foreign sources of supply, they continued to extend financial assistance in the development of iron deposits in the Philippines. Three new properties, located in Zamboanga, on Mindanao Island, were being explored and developed with Japanese financial and engineering aid.

Total shipments of iron ore in 1958 dropped by 18 percent to 1,098,732 metric tons, compared with 1,346,363 in 1957. Philippine Iron Mines, Inc., still the country's number one iron mine, shipped a total of 938,134 tons, compared with the 1957 shipments of 1,019,906 tons. The balance was shipped by three other mines.

Palawan Quicksilver Mines, Inc., the lone mercury producer, showed a slight drop in production to 3,321 flasks compared with 3,363 in 1957.

New Guinea

Gold output was estimated at 44,014 fine ounces, and silver output at 24,512 fine ounces. The Morobe field (Wau and Bulolo deposits) was again the major source of production. A large ore body carrying gold at Kainantu contains values sufficiently encouraging to warrant an expanded prospecting and development programme but prospecting generally is inactive despite the fact that "gold is known to occur from the Sepik District to Sudest (Tagula) Island at the eastern end of the Louisiade Archipelago" (statement from Department of Lands, Surveys, and Mines, Port Moresby).

No major field testing operations have commenced on copper deposits near Port Moresby which were the subject of earlier reports. Nickeliferous soils in the ultra basic rocks of the Owen Stanley Ranges were the subject of some investigation but no significant economic prospects were revealed.

Summing up, as in other recent years, the potentialities of New Guinea are relatively unknown and are likely to remain so until necessity causes the introduction of risk capital.

Fiji

Productive mining was mainly confined to gold and manganese, with minor outputs of copper and magnetite. The copper ore, 578 tons of 7.0 percent Cu, came from exploration work as Sawakasa, and the 1,423 tons of magnetite was from the collection of detrital boulders in the Momi area.

Manganese mining is done by small syndicates, since the deposits generally are small and high grade. One deposit, at Nabu, seems promising, and preliminary

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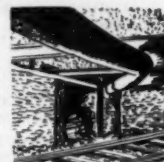
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Oceania

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Gold Ore Mined and Milled in Long Tons, Ounces of Gold and Silver Recovered, and Long Tons of Manganese Mined in Fiji in 1956, 1957, and 1958

Item	1956	1957	1958
Gold-Silver			
Mined, tons	164,819	181,334	189,780
Milled, tons	165,987	208,507	191,737
Gold, fine ounces	67,282	78,807	81,827
Silver, fine ounces	24,080	25,278	17,670
Manganese			
High-grade, 48-60% Mn	18,262	20,698	20,046
Low-grade, 35-48%	0	6,766	0

Gold mining was carried on only in the Vatukoula field where the two small rich mines are now exhausted and the Emperor Gold Mining Company remains as the sole producer. Development in the Emperor property continues at a high rate and sufficient ore has been exposed to show an increase in reserves above the tonnage mined.

On 15 Level, installation of bulkhead doors to withstand the known water pressure in excess of 700 pounds per square inch, has been completed and crosscutting eastward into the "mudstone" basin has been resumed. Progress is slow because extensive grouting is needed in the highly sheared zones.

An extensive program of mill modernization and shaft sinking has started and should result in considerable reductions in treatment and transport costs.

For 1959, prospects are for an increased tonnage of gold ore treated, and a higher gold output.

British Borneo

British Borneo is made up of three territories: Sarawak, North Borneo, and the State of Brunel, occupying about 80,000 square miles of northern Borneo.

Economic results of geological work provided a bright feature in 1958, a year otherwise marked by recession. A new industry, bauxite mining, successfully started in Sarawak; prospecting for a mineral of new importance, chromite, began in North Borneo, and testing increased of some of the regions' other mineral resources. Geological mapping and research continued to make good progress. The output of mineral products is shown on the attached table.

Bauxite was the highlight of the year; the new mine quickly overcame initial mining and shipping difficulties, produced over 136,000 tons of ore, and exported 99,930 tons worth about M\$1,837,000. Prospecting gave encouraging results and arrangements were completed for increasing production in 1959.

Chromite. Arrangements for prospecting occurrences found during geological work were completed. Tests will be made by an experienced British company mining chromite in West Africa. Cement making; inquiries were received mainly from Britain, Malaya, Hong Kong, and Japan. Investigations show extensive reserves of suitable raw materials exist in both east and west Sarawak. Glass sand of high

purity, and relatively conveniently situated for transport, was found at three localities.

Geological mapping continued steadily, two surveys covering 7,100 square miles being completed, and the descriptive memoirs printed. Geological mapping in Borneo involves exploration of often remote jungle-clad, sparsely populated, mountainous areas, in tropical temperatures. It is slow, arduous work, however, 35,500 square miles have now been explored and described. Compilation and reassessment of past geological work was started in cooperation with geologists of the oil companies and has already yielded useful new information.

New Caledonia

Production of nickel-cobalt ore with combined assays of 2.6 to 3.8 percent, which had reached 1,800,000 tons in 1957, dropped to less than 600,000 in 1958. Operation of the Yate dam hydroelectric project was expected to provide more power for nickel smelting and refining, but economic circumstances impeded this development, and so production of nickel metal dropped from 10,300 tons to less than 9,000 tons in 1959.

65,000 tons of cobalt ore assaying 0.10 to 0.30 percent were mined during the year. About 1,600 tons of 2.4 percent concentrates were produced.

There was quite a noticeable drop in production of chrome ore from 63,000 tons to about 46,000. On the other hand, iron ore output increased 55 percent, or from 235,000 tons to 290,000. Approximately 8,500 tons of magnesium were produced.

New Zealand

The gold industry continues in its deepening twilight, an estimated 25,000 ounces being produced in 1958 (1957: 30,195 ounces). The Taramakau (West Coast) dredge of Kanieri Gold Dredging Ltd. was again the major producer with about 14,000 ounces from 4,000,000 cubic yards of wash. This is a good property, with some high bore values; however, boulders in the gravel lead to a relatively low recovery of 60 percent. Costs remain low.

No significant developments occurred in the search for uranium and other prospecting was also at a low ebb. A Committee was set up by the Government to advise on the prospects of developing an iron and steel industry. No report has yet been made public.

Two companies have expressed a desire to enter the production of iron and steel. It is probable that a small industry based upon scrap will be established in the first instance but major development of the country's vast titaniferous iron sand reserves remains remote.

Pacific Islands

Following earlier work in conjunction with the Bureau of Mineral Resources (Australia), in which the Cook Islands group and Chatham Islands were studied, the Mines Department (N.Z.) and the Australian Bureau found 8,000,000 tons of low grade phosphate rock on Bellona Island, British Solomons. Further searches for phosphate will be made.

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AFRICA

Algeria

Despite the political instability during 1958, there was renewed activity in certain segments of the mining industry, notably in smectic clay and pyrite. Production of smectic clay increased from 114,000 tons in 1957 to 150,000 in 1958; production of Kieselguhr rose to 14,000 tons from 9,400 in 1957. Pyrite output totaled 23,000 tons, including 11,000 tons of sulphur, has been continuing to increase steadily since 1956; in 1955 it was shutdown completely.

Production of iron ore which had increased by 6 percent in 1957 with 2,790,000 tons, is in a noticeable decline. Only 2,200,000 were produced in 1958. Following the recession, the German and English steel firms did not take the total tonnage they had ordered. There is talk of installing a steel mill at Bone which would absorb 800,000 tons of domestic ore. A new mine went into operation in August at Kanghet. It produced 18,000 tons of ore before year's end.

There was a renewed interest in zinc production; 53,000 tons of concentrate were recovered compared with 49,000 in the previous year. About 31,000 tons of zinc metal were produced. Lead output was about the same as in 1957, with 14,000 tons produced, compared with 15,000 in 1957. 10,000 tons of lead metal were produced.

Phosphate production was on the decline with 560,000 tons produced, as compared with 600,000 in 1957. Phosphates are partially treated on the spot to make fertilizer.

Ghana

On the basis of returns available for the first 10 months of 1958 it is reasonable to suppose that the high level of mineral production attained in 1957 was exceeded. The reason being that bauxite exports went up despite a falling off of world aluminum consumption.

The gold mining industry also had a good year and this was, to some extent, due to the fact that certain marginal mines (Amalgamated Banket Areas, Ghana Main Reef, Bibiani and Bremang) were subsidized by the government pending the completion of an independent report on the gold mining industry with special reference to marginal producers.

The rich Ashanti Goldfields Corporation Ltd. was still improving reserves in that exceptionally high development results were encountered. Good news also comes from Ariston Gold Mines (1929) Ltd. where high-grade ore was exposed. At Bibiani (1927) Ltd. the position is still rather doubtful as the future depends on the discovery of unknown major ore bodies, but it is noteworthy that the characteristic features of such ore bodies as were developed on and below the 19th level was that they are relatively small, but of a much higher grade than the average grade of current ore reserves.

The building of the Volta River hydro-electric scheme—so important to the country's future prosperity—was discussed between president Eisenhower and Ghana's president, Dr. Nkrumah, on the latter's visit to the United States. Certain aluminum companies also joined in the debate with a view to obtaining some indication of what the United States government would be prepared to do in order to get this project

off the drawing board. In this connection it was suggested that any direct United States government contribution is unlikely to exceed \$25,000,000 which is only a little over 8 percent of what the estimated total expenditure would be concerning the development of the bauxite mines, the construction of the Volta dam and power installations, the erection of an aluminum smelter producing 210,000 tons aluminum a year, the building of a township and railway, as well as the completion of Tana port.

Towards the end of the year there occurred an unprecedented dispute involving the British Camp Bird Ltd. (a holding company which inter alia controls the Camp Bird mine in Colorado), and the Ghana government. This has, to some extent, obscured the outlook concerning Ghana's attitude towards the mining industry because, according to Camp Bird, a promise was made by the Parliamentary Secretary to the Ministry of Information (now said to have been given without the necessary authority) that Camp Bird would have all of Ghana's mineral rights for the next

50 years. Following the temporary suspension of dealings of Camp Bird shares on the London Stock Exchange, that company, however withdrew from the quarrel and the organization specially formed to exercise these rights was dissolved.

Belgian Congo

Despite the unstable world copper situation in 1958, Union Miniere du Haut Katanga, Belgian Congo's huge copper producer, produced 235,000 metric tons, or only about 12,000 metric tons less than the all-time record output of 247,453 metric tons produced in 1956. Early in the year, the company had planned to cut back to 90 percent of 1956 output, or about 222,000 metric tons, because of the persistent weakness of the copper market. The company also decided to postpone construction of the second half of its Luilu electrolytic plant until 1962. By year's end, though, it appeared that the firm was producing about 22,000 tons

Ghana Mineral Exports and Value in 1955, 1956, 1957, and 1958¹

Commodity	1955		1956		1957		1958 ¹	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Bauxite ²	116,285	£ 203,505	137,872	£ 331,207	185,403	£ 451,910	188,340	£ 448,107
Manganese ²	539,580	5,192,232	635,851	7,043,796	641,343	8,990,049	465,796	7,801,681
Gold ³	723,965	9,048,535	599,340	7,488,781	788,151	9,793,511	707,022	8,789,289
Silver ⁴	(5)	(5)	(5)	(5)	25,390	8,390	16,958	5,400
Diamonds ⁴	2,276,531	5,529,624	2,518,563	7,920,446	2,930,901	8,979,359	2,624,493	6,907,539
Total Value		£19,973,896		£22,784,230		£28,223,219		£23,952,016

1. First 10 months of 1958. 2. Metric tons. 3. Troy ounces. 4. Metric carats. 5. No returns available.

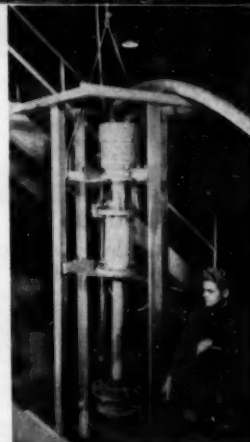
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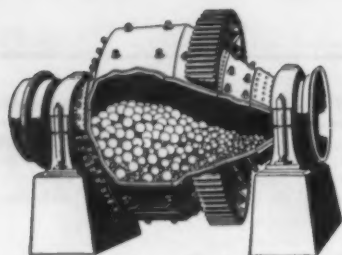


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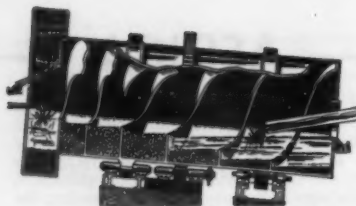
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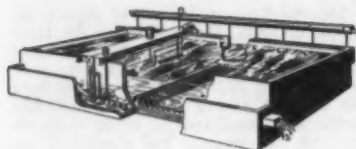
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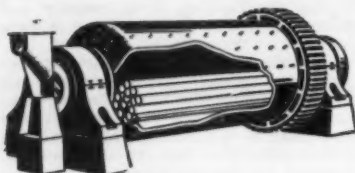
CONICAL MILLS



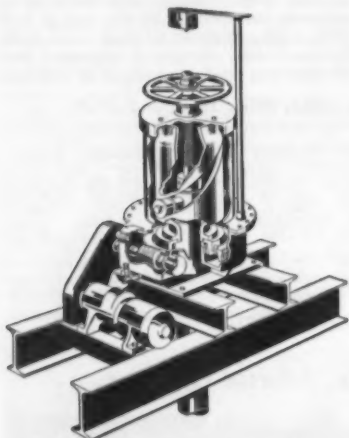
COUNTER-CURRENT CLASSIFIERS
HEAVY-MEDIA SEPARATORS



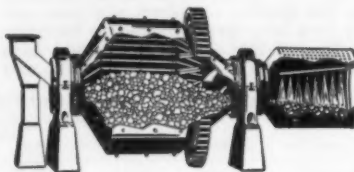
AUTOMATIC BACKWASH SAND
FILTERS



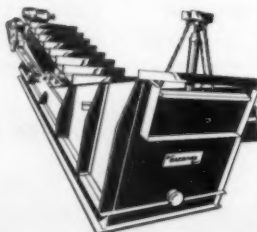
ROD MILLS



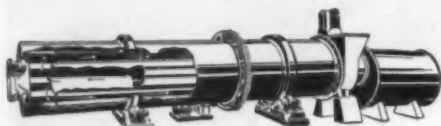
"AUTO-RAISE" THICKENER MECHANISMS



CONICAL ORE SCRUBBERS



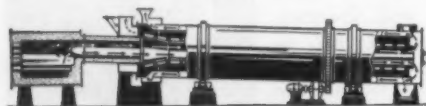
OVERDRAIN CLASSIFIERS



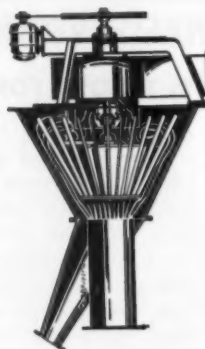
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Africa

of copper per month from its Congo mines.

1958 was a peak year for diamond production in the Belgian Congo. Estimated production for the year totaled 16,673,-464 carats, an increase of 1,000,000 carats or about 8 percent over the previous year. Of this amount, 1,600,000 were produced by Societe Miniere du Beceka at its Bakwanga mines, and about 669,320 carats were produced by Forminiere Company from its concession holders in the Kasai alluvial fields.

Societe Miniere du Beceka is constructing a new Central plant for the treatment of gravel and kimberlite material at the Bakwanga mines, and is building a new concentrating plant for its manganese operations at Dilolo. Additional power is to be purchased for the latter plant from the Union Miniere operations at Kolwezi.

The government was also concerned with power, and during 1958 agreed to sponsor the construction of a huge hydroelectric plant at Inga. The complete plan would involve an investment of \$3,000,-000,000 which would come from many sources. In its first phase, the plant would be able to produce 1,500,000-kw, and its final phase it would have an output of about 25,000,000 kw.

Cameroun

On the whole, mineral production decreased during the year. While the tin mines were able to maintain their output of 115 tons, compared with 108 tons in the previous year, the production of gold dropped from 340 kilograms to 62, and rutile output was nil, compared with 40 tons in 1957.

On the other hand, the new aluminum plant at Edea which was commissioned in 1957 and produced 7,600 tons of metal in ingot form, appeared to be developing in a satisfactory manner.

Bechuanaland

Bechuanaland, with an area of 300,000 square miles remains mostly unmapped and its mineral potential hidden to a large extent by a cover of Kalahari sand. The Geological Survey, established only in 1948, is making considerable progress, and has succeeded in not only gaining, but publishing information on the Protectorate. Several of the larger mining groups are endeavoring to obtain prospecting concessions.

The Crown Grant awarded to Marlme Chrysotile Asbestos Corporation for the right to prospect for and mine manganese was extended to cover the whole of the Bangwaketse Tribal Territory.

In the Bamaletse Reserve the B. P. Mining Corporation suspended operations at Ramoutsa manganese mine, but located a high grade deposit on the N. W. slopes of the Ootsi Mountain similar to the occurrence at Kgwakwe.

Mining operations at Moshaneng Asbestos were increased to a production rate of over 200 tons fiber per month. No production of kyanite was recorded from the Tati Concession area, the leases having been largely worked out.

The Geological Survey continued drilling exploration of potential coalfields. In an area of nine square miles investigated, it has been estimated that to a depth of 450

Africa

ft. the reserves of coal are approximately 150,000,000 tons with a calorific value of 11.3 per pound with ash content of 12 to 14 percent.

The mining outlook for 1959 will depend on the successful conclusion to current negotiations for prospecting rights in various parts of the Territory.

Asbestos was most valuable mineral product; 1,734 short tons sold for £139,911 (1,581 tons in 1957). Manganese output was 5,893 tons.

French Equatorial Africa

The United States Steel Corporation's subsidiary—Cie Miniere de L'Ogooue (COMILOG)—finalized plans during 1958 for a 200 mile railroad south from its vast manganese deposits to Brazzaville. Exploration at Mouanda (Gabon) had developed many millions of tons of thinly covered ore about 15 feet thick assaying 40 to 50 percent manganese. The railroad is the final step in bringing these deposits into production.

Exploration continued with very favorable results on the uranium deposits at Mounana. Final plans to bring these deposits into production were being evaluated.

Diamond production in Oubangui declined to 93,000 carats in 1958 from 109,000 in 1957. Gold was down to 649 kilograms from 957 in 1957. Lead concentrate (52 percent Pb) output was increased to 6,500 tons; 3,480 in 1957.

French West Africa

During 1958, only 414,790 tons of iron ore were produced, as compared with 1,091,000 tons in 1957. Mines in French Guinea had particular difficulty in marketing their ore.

Bauxite production was off, from 385,000 tons in 1957 to 330,000 tons in 1958. A study of the bauxite deposits in Guinea was continued during the year in conjunction with plans for a vast hydroelectric power project on the Konkoure River.

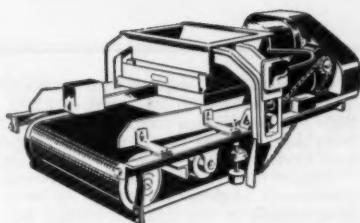
After a drop in diamond production in 1957 (222,000 carats), there was a noticeable pickup in diamond mining in 1958 with an output of 281,000 carats. New diamond fields were discovered in the French Sudan-French Guinea area.

The mining of titanium beach sands south of Dakar was fairly steady, with an output of 33,500 tons of ilmenite in 1958, compared with 36,000 in 1957. Also produced from this area were 1,050 tons of rutile and 6,900 tons of zirconium.

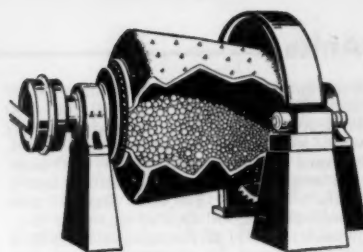
Phosphate production rose during the year to 104,580 tons. A small deposit of manganese was in the process of development along the Ivory Coast. It will probably go into production in 1959.

Madagascar

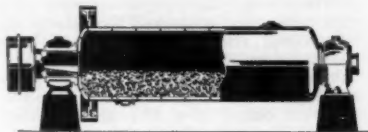
Graphite continued to be the most important mineral in Madagascar in 1958. However, declining demand limited pro-



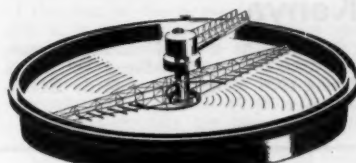
CONSTANT-WEIGHT FEEDERS



TRICONE MILLS



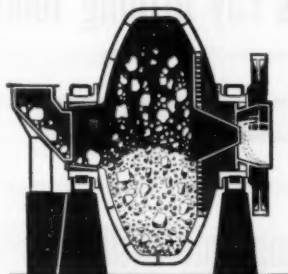
BALL AND PEBBLE TUBE MILLS



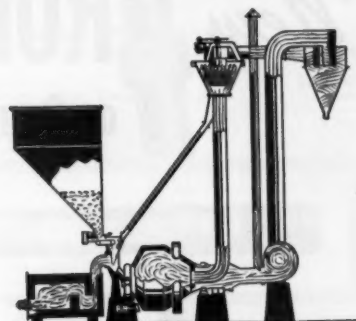
CENTER-PIER CLARIFIERS AND THICKENERS



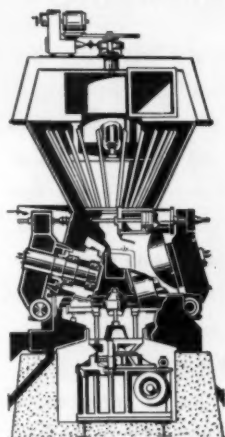
HYDRO-CLASSIFIERS



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Africa

duction to less than 13,000 tons; 15,000 in 1957. Mica output was up from 800 to 1,000 tons. Other mineral products were: piezo-electric quartz, 4 tons; beryl, 60 tons; and industrial garnet, 180 tons.

A bright future was predicted for heavy sands. Treating 100,000 annual tons should yield 1,500 tons of monazite concentrate, 30,000 of ilmenite, and 1,800 of zircon.

Kenya

Minerals to a total value of some £4,300,000 were produced in Kenya during 1958, an increase of nearly £500,000 over 1957.

Magadi Soda Company Ltd. produced 111,038 tons of soda ash worth £1,275,825. Salt production from this mine and from the Fundisha Works totalled 18,696 tons having a total value of £146,725.

Copper output from Macalder Nyanza Mines was slightly lower due to technical trouble at the mill but overall production remained satisfactory, 2,040 tons of copper being sold at a value of £394,881.

There was a slight improvement in gold production and a marked increase in silver. Good results were obtained from alluvial deposits in the new Elgeyo-Marakwet district where very little prospecting has taken place before. In addition, the output of gold from Macalder-

Kenya Mineral Production for 1957 and 1958

Mineral	1958	1957
Copper ¹	2,040	2,115
Diatomite ²	3,373	4,229
Gold (refined) ²	7,753	7,387
Graphite ²	659	942
Kaolin ²	1,185	1,140
Pumice ²	773	2,071
Salt ²	18,696	22,602
Silver ²	44,146	23,051
Soda ash ²	118,440	111,038
Vermiculite ²	86	30

1. Tons. 2. Fine ounces.

Nyanza was greatly increased. A total of 7,753 ounces of gold and 44,146 ounces of silver were produced in Kenya during the year having a combined value of £111,210.

In other minerals, output was generally in small quantities only. Diatomite and graphite were the most important, although columbite, feldspar, magnetite, and vermiculite were also mined on a limited scale. At Mrima Hill, the columbite bearing deposit being investigated by the Anglo-American Prospecting Company Ltd. work ceased during the year. No definite statement on the further development of this prospect has been announced.

Morocco

An all-time high in phosphate exports for 1958 and prospects for an even higher output during 1959 were the main features of Morocco's 1958 mining statistics.

Output of phosphate totalled 6,335,822 at the Khouribga and Louis Gentil mines, compared to 5,567,519 tons in 1957, while exports in 1958 were 6,332,547 tons. In 1959, according to the Société Chérifienne des Phosphates (a State enterprise), exports are expected to reach a total of 7,500,000 tons or 2,000,000 more than in 1957.

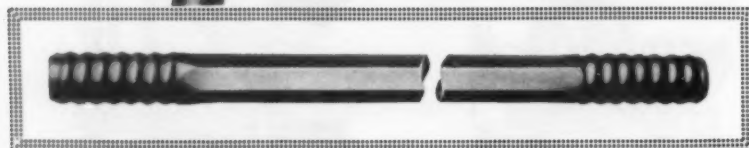
Apart from substantial gains in output of lead (136,936 tons compared with 128,464 in 1957), iron pyrite (18,450 tons—6,260), cobalt (9,259 tons—4,230), copper (3,874 tons—2,138) and barite (42,692 tons—14,765), there were decreases in production of all other major Moroccan minerals.

Zinc production was slightly off the 1957 figure with 86,771 tons in 1958, while manganese fell from 415,099 tons to 353,661 (metallurgical grade) and from 77,053 tons to 56,424 (chemical grade). At the Imini mines, operated by the Société Chérifienne des Etudes Minières, which normally turn out over half of total Moroccan production, a strike of truckers and workers at the mine's 11-mile overhead cableway in January 1959 was expected to put a further brake on exports which dropped to about 180,000 tons (all grades) in 1958.

Iron ore production was down from 1,868,122 tons in 1957 to 1,538,426 in 1958, and exports were also down to 1,330,254 tons. There is still no firm news of the proposed steel plant to be built at Nador using the R-N process and ore from the mines operated by the Societas de Minas del Rif, except that the Director of the Moroccan National Bank (recently incorporated in Casablanca with 1,000,000,000 Moroccan Francs capital) said in an interview that his bank planned to arrange the financing of the project.

Export taxes on lead, zinc, manganese

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and cobalt ores are to be reduced from five percent to one half percent, according to officials in Rabat, and import concessions to the mining industry in the form of cheaper electric power, coal, and other fuels are to be made also. In addition, certain imported products used in the concentration of ores will be granted reductions in import duties, according to the same source. These measures, which are designed to compensate for difficulties which may be encountered by Moroccan minerals in world markets because of the new monetary status of Morocco, will be published shortly in the form of an official decree. Officials say each case will be judged on its individual merits and applications for the special benefits must be sent to the Ministry of Economy (Industry and Mines Department).

Mozambique

The most significant event of 1958 affecting the mining industry was the lifting of the ban on prospecting in the Alto Ligonha pegmatite area which had been closed to prospectors, by government decree, since 1946. As a result of this Central Government action prospecting was considerably increased and a great number of claims were filed. Minas do Lice, Lda., started prospecting the area of its 500 square kilometer concession on a limited scale. Sociedade Mineira do Melela, Lda., and Monteminas, Lda., started an intensive, systematic search by midyear; the first in its concession of about 2,000 square kilometers and the

latter on public land. The production of minerals, especially beryl and columbite, from this pegmatite area was seriously affected by the drop in prices which took effect during the first quarter of 1958. A substantial increase in production of both minerals is to be expected in 1959 as the deposits being staked start producing, provided prices climb.

In the Tete District Companhia Carbonifera de Moçambique continued mining and exporting coal to the neighboring territories at about the same production rate as for 1957. Companhia General Mineira do Chidue (a subsidiary of The Central Mining and Investment Corporation, Ltd.) abandoned its drilling operations into the Chidue copper deposit soon after the copper price drop. The work may yet be resumed as the concession is valid until June 1961. Companhia Mineira Lillas de Moçambique, Lda., continued prospecting the area of its concession in a very reduced scale.

Sole rights to prospect for and develop

uranium mineral deposits were awarded, at the end of 1957, to Entrepoto Comercial de Moçambique. No prospecting or development of the already known deposits of the area was carried out by the company. The period of exclusive prospecting rights ends in October 1960.

Minerais Basicos de Moçambique completed installation of its plant and facilities for the recovery of heavy minerals from the beach sands of the Bay of Pebane. Tests were carried out at the end of the year at the newly installed plant and it is reported that production will start early in 1959. This should develop into a major mining operation as the reserves of ilmenite, rutile, zircon, and monazite in the sands of the Bay of Pebane and vicinity are said to be very extensive.

Large perlite deposits were found along the Goba-Lourenço Marques Railway. Drilling on a considerable scale was carried out during the year by the Geology and Mines Department of the govern-

Mineral Production of Mozambique in 1957 and 1958

Commodity	1957		1958	
	Quantity, Kilograms	Value, US Dollars	Quantity, Kilograms	Value, US Dollars
Asbestos	138,000	26,600	367,000	19,500
Bauxite	5,043,000	9,441	2,962,673 ¹	5,500
Beryl	1,696,723	587,915	852,772	255,800
Bismuthinite	3,555	5,830	800	1,300 ²
Columbite-tantalite	130,864	436,000	235,874	864,800 ²
Gold	29,826	29,800	36,000 ²	39,000 ²
Lepidolite	343,860	7,000 ¹	150,000	2,870
Mica	30,170		300	
Tourmaline	34,260	1,200 ¹	936	

1. Production for three quarters. 2. Estimated.

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ment. It is reported that South African companies are interested in the development of the deposits with the view to the production of expanded perlite for consumption by the Union of South Africa's fast growing market.

Nigeria

Under the International Tin agreement the tin industry in Nigeria worked under severe restrictions for the whole of the year and as a result production as well as exports fell by about 36 percent. Operating profits of the mines therefore dropped considerably but, undeterred by this setback, some of the leading companies carried out prospecting activities which showed encouraging results in that new tin as well as columbite, tantalite, pegmatite, and lead deposits were discovered.

Towards the end of the year revived interest was shown in the columbite market, and although production for the second half of the year was only 395 tons as against 410 tons for the first half, railments from Jos were 601 tons in the second half as against 283 in the first. Most operators liquidated their stocks of high-grade columbite and a number obtained forward contracts for the whole of their 1959 production. The average price received over the year was in the region of 176 Shillings per unit.

In spite of the depressed state of the lead and zinc markets, the production from Wase remained at approximately the same level. The position as regards starting production at Abakaliki still depends on the question of finding the necessary financial backing.

A small stamp battery was installed by one operator at Ilesha to work on the gold reef at Iperindo. Production from this has balanced the steady decline in production from alluvial workings.

As far as minor minerals were concerned there was a steady demand for tantalite in both high and low grades, but prices decreased during the year. The monazite and thorite market completely disappeared but some sales of zircon were made and the future for this mineral looks promising. Zircon, like thorite, is a byproduct from mill rejects from primary columbite processing, and the value of Nigerian zircon lies in the fact that it contains a high proportion of hafnium. The ratio of hafnium to zirconium plus zirconium is between 5 and 7 percent.

The existence of barite veins in Nigeria has been known for some time and interest was taken in them owing to the large quantity of the mineral that is being used in connection with oil drilling. Samples taken from some of the veins indicate that the mineral fits required specifications with little beneficiation.

Metal and Mineral Production in Northern Rhodesia in 1956, 1957, and 1958 and Value in Rhodesian Pounds

	1956		1957		1958*	
	Quantity	Value £	Quantity	Value £	Quantity	Value £
Gold ¹	3,329.4	41,067	3,802	36,550	3,673	44,777
Silver ¹	609,107	191,285	534,056	165,728	556,523	172,193
Cobalt, metal ²	16,442	1,928,900	21,453	1,983,090	20,950	1,877,120
Cobalt, alloy ²	2,416	110,478	977	46,862	—	—
Cobalt, other ²	7,061	357,728	45,186	464,932	121,186	1,068,830
Copper, blister ²	157,531	47,271,095	169,531	34,200,053	133,423	23,191,913
Copper, concentrate ²	584	29,659	2,692	119,906	3,206	126,900
Copper, electrolytic ²	225,953	73,729,521	246,580	54,416,299	241,526	46,659,091
Copper, other ²	70	19,805	831	66,981	706	125,844
Lead ²	15,200	1,768,495	15,000	1,436,559	13,043	949,406
Manganese ore ²	39,438	491,422	36,869	479,802	44,595	575,244
Selenium ²	32,712	121,764	26,656	106,520	24,805	60,765
Zinc ²	28,925	2,828,266	29,500	2,396,028	30,250	1,994,631
Uranium oxide ⁴	—	—	52,457	—	101,080	—
Beryl ³	—	—	5	595	11,44	1,418
Limestone ³	367,046	371,997	449,283	376,400	409,017	353,859
Mica, sheet ⁴	5,821	1,455	627	157	1,940	485
Phyllite ²	4,215	632	16,966	2,545	23,694	3,554
Amethyst ²	3,128	120	—	—	3,798	165
Cadmium ²	52	69,721	56	74,124	17	19,132
TOTAL VALUE		£129,334,941		£96,373,129		£77,225,327

1. Fine ounces. 2. Hundredweight. 3. Long tons, 2,240 pounds. 4. Pounds. *Preliminary subject to adjustment.

Northern Rhodesia

The year 1958 proved to be another eventful year for the mining industry of Northern Rhodesia. Starting off on a somewhat subdued note, with base metal prices showing little tendency to rise above the very low levels of the previous year end, fresh setbacks were sustained when one new copper mine suspended operations at the end of March and, towards the end of the year, a seven weeks strike brought all operations on the Copperbelt to a standstill. On the credit side, a new copper refinery went into production and there was later an appreciable improvement in copper prices.

The most noticeable event, although possibly not the most important from a production standpoint, was the closing of Bancroft mine of Anglo-American group at the end of March. Bancroft had been rapidly brought into production during the previous year but excessive water and bad ground so seriously interfered with mining operations that production was well below the rated capacity of 40,000 long tons of copper per year. Operation of the mine under these conditions, with the then prevailing low price of copper, was recognized as uneconomic and the decision was made to close the mine for 12 months and, during that period, to carry out an intensive program of underground development. Toward the end of the year it was confirmed that production would be resumed on April 1st, 1959.

Kansanshi copper mine, a small mine under Anglo-American control and situated to the west of the Copperbelt and near the Belgian Congo border, remained

shut down during the whole of the year following the flooding of the mine in November, 1957. During the year, further investigations were made to develop improved treatment methods for the ore which contains an appreciable proportion of chrysocolla. Encouraging progress has been reported and future reopening of the mine is anticipated.

Nchanga Consolidated Copper Mines, Ltd. maintained the position of premier copper producer on the Copperbelt and increased the rate of development of its two open pits. In the larger, Nchanga pit, erection of a mobile bucket wheel excavator and a mobile boom stacker, together with the installation of a 48-inch wide belt conveyor, 12,500-feet long, were almost completed by the year end. This equipment will be used to strip overburden. Ore from the pit, mined by conventional power shovels and delivered to the concentrator by railway cars, now constitutes a large proportion of total mill feed. Reserves of the Nchanga ore body are given as in excess of 86,000,000 tons at 3.6 percent copper, but much of this is too deep to be mined by present open pit methods. Ore production at the smaller Chingola pit commenced in April and was brought up to about 25,000 tons per month, using power shovels for mining and Euclids for ore transportation to the concentrator.

Mufulira Copper Mines Ltd. completed the erection of a concrete headframe at Mufulira West and actively proceeded with the development of this ore body which will later increase annual copper production by upwards of 50 percent.

Rhokana Corporation Ltd., which is Northern Rhodesia's only uranium producer, almost doubled production from 52,457 pounds uranium oxide in 1957 to 101,050 pounds in 1958. At the Nkana concentrator, work commenced on the change-over from a three-stage crushing-ball milling circuit to two-stage crushing followed by a stage of rod milling ahead of ball mills. This will be the first property on the Copperbelt to use rod milling.

Roan Antelope Copper Mines Ltd. completed the addition of an anode casting section to the smelter and a fourteenth grinding section was added to the concentrator. In December, a Copperbelt record was established of 542,500 tons mined and milled.

Nigerian Mineral Production in Metric Tons and Approximate Values for 1955, 1956, 1957 and 1958

Commodity	1955		1956		1957		1958	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Tin	11,399	£ 5,868,474	13,364	£7,297,490	13,150	£7,160,000	8,419	£4,555,000
Columbite	3,047	5,166,927	2,406	1,762,135	1,923	1,177,000	805	516,000
Tungsten	3	2,153	5	4,267	2	800	—	—
Lead	73	3,963	105	8,450	623	49,000	624	35,000
Tantalite	9	9,692	15	20,266	17	34,000	22	61,000
Other minerals	—	—	749	29,525	1,247	73,000	196	13,000
Gold ¹	—	—	—	—	487	6,000	646	8,000
Total Value:		£11,051,209		£9,122,133		£8,499,800		£5,188,000

1. Troy ounces.

Ndola Copper Refineries, a Roan Antelope subsidiary which will electrolytically refine blister copper from that mine, started the first unit in October. Rated annual capacity is at present 55,000 long tons of copper per year, but that will be doubled by the addition of a similar unit now under construction. The adjoining cobalt plant of Chibuluma Mines Ltd. continued to treat a cobalt-bearing copper concentrate from that mine and produced a cobalt-enriched copper matte that was shipped to Belgium for further metallurgical treatment. Copper concentrate was smelted at the Roan Antelope smelter.

All productive operations ceased on the Copperbelt on September 12th, following a strike by the Northern Rhodesia Mine Workers' Union (white) consequent on a refusal to accept all proposals put forward by the mining companies which had as their objective the more efficient utilization of labor by the removal of restrictive practices exercised by the Union. After protracted negotiations, the Union agreed to accept the finding of an independent arbitrator and returned to work on November 7th, after a seven week stoppage, virtually on terms originally proposed by the companies.

The two main producing mines of Selection Trust group—Mufulira and Roan Antelope—operated for the greater part of the year with a 10 percent production cut to assist in preventing a further deterioration in world copper prices. The smaller, newer mine of the group—Chibuluma—continued to produce at maximum capacity. Anglo-American, which had already stated that the inability of Bancroft to reach scheduled production was, in effect, a restriction in output, divided part of Bancroft's potential capacity between Nchanga and Nkana when the former mine closed down. Following the end of the Copperbelt strike, all producing mines resumed operations at maximum capacity.

Mtuga Mine, Northern Rhodesia's only independent copper producer, situated in the Mkushi District, continued to produce a small quantity of concentrate which was shipped to Europe for further treatment.

Rhodesia Broken Hill Development Co., Ltd., which was not involved in the Copperbelt labor dispute, produced zinc at the normal rate but lead production was cut back by about 13 percent and cadmium production dropped back to 17 tons compared to 56 tons for the previous year. A new dam was completed across the Lunsemfwa River which will now ensure ample water supplies over the dry season for the hydroelectric power plant that supplies the mine.

Bahati Mine, in the Fort Rosebery district, contributed the larger part of the year's manganese ore production. Smaller quantities were derived from two properties of Gypsum Industries at Chiwele and Lunsemfwa, in the Broken Hill district.

Active prospecting continued throughout the year, not only by the two main mining groups but also by Rio Tinto and South African mining interests.

The year 1959 is looked forward to with confident optimism as the general opinion is that the recent copper prices of between £230 and £240 per long ton are realistic and should be maintained during the year. At that price level, all mines can operate with a satisfactory profit margin. No major developments are expected but steady progress is scheduled, with some possibility of an increase in output.

Nyasaland

Mineral investigation in Nyasaland in 1958 was again mainly concerned with radioactive minerals. Owing however, to the lack of demand for radioactive monazite, the working of the deposits on the western shore of Lake Nyasa is not likely to prove an economic proposition at present. The interested parties are, however, maintaining contact with the area, to take advantage of any favourable change in the world market.

Recent analysis of minerals taken from the Tambani area in the Southern Province failed to disclose the presence of any really significant radioactive

mineralization. Although a few drill core samples showed interesting amounts of molybdenum over short section of core, it is unlikely that the mining company concerned will pursue its investigations much further, unless the demand for columbium minerals greatly increases. The same company was investigating the metallurgical method for the recovery of uranium-pyrochlore ores from Ilomba Hill in the Northern Province.

Active field work continued in connection with the ilmenite and rutile deposits in the Lower Shire Valley.

Further research is being conducted by Anglo-American Rhodesian Mineral Exploration Ltd., concerning the treatment necessary to render crushed apatite rock,



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Africa

from the phosphate deposit at Tundula Hill, effective for use in plant nutrition. The same company commenced prospecting in the Mpemba Hill area near Blantyre. Although the company is interested in all base metals, its particular interest at Mpemba is nickel.

No further steps were taken towards the development of the pyrochlore deposits on Chilwa Island in view of the lack of demand and the low price.

In 1958, as a sample consignment the iron ore venture in the Blantyre district exported 5,750 tons containing 67.40 percent iron.

Sierra Leone

In 1958 in Sierra Leone there was some decrease in the amount of licensed alluvial diamond mining by African diggers, while the sales of diamonds to licensed exporters from this source declined from £5,307,923 in 1957 to £4,548,377 in 1958. The production of diamonds by Sierra Leone Selection Trust Limited, however, showed a substantial increase so that the total carats exported was higher than in 1957. Illicit mining within the area over which that company has mining rights increased during the year so that government was forced to take stern action. There are now grounds for optimism that recent measures have been successful, and that illicit mining is now on the decrease.

The production of iron ore at Marampa by the Sierra Leone Development Company showed a slight decrease in 1958, as compared with 1957, due to the recession in the steel industry. However, the erection of the new mill was well advanced by the end of 1958, and will be complete by March 1959. This will increase the production of iron ore concentrate from 1,000,000 to 1,500,000 tons a year. In addition the erection of an aerial tramway to remove overburden was completed and in operation by the end of 1958. The geological study of the iron ore deposits at Tonkolili was successfully completed during 1958, and development of these deposits now awaits the necessary finance.

The British Titan Products Limited in partnership with the Columbia Southern Chemical Corporation Inc. of the United States continued to prospect for rutile within their special exclusive prospecting license. Towards the end of the year application was made for the transfer of the license from the name of the British Titan Products Ltd., into the joint names of Columbia Southern Chemical Corporation and Consolidated Zinc Corporation.

The production of chromite showed a decline due to difficult market conditions.

A well known American company was interested in prospecting for bauxite, and a team of geologists will be engaged in preliminary reconnaissance work in 1959.

The outlook for 1959 remains bright with the production of iron ore and dia-

Metal and Mineral Production and Value in Southern Rhodesia in 1956, 1957, and 1958

Commodity	1956		1957		1958	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Gold ¹	536,392	6,657,964	536,849	6,663,635	554,838	6,886,929
Gold premium ²	—	66,735	—	84,672	—	63,373
Silver ¹	76,870	25,229	74,179	24,219	264,630	83,392
Antimony ore ³	114	10,904	139	12,481	251	10,504
Arsenic ³	1,084	8,672	883	6,260	683	3,774
Asbestos ⁴	118,973	8,524,671	132,124	9,016,388	127,115	8,593,726
Beryllium ore ³	606	69,045	572	63,751	332	33,822
Chromite ore ³	448,968	2,671,088	654,077	4,517,500	618,845	3,976,538
Columbite ore ³	254	1,463	359	126	—	—
Copper ³	1,932	405,757	1,118	254,444	8,430	1,003,692
Corundum ³	4,448	27,670	4,506	29,329	4,594	29,378
Fluorapatite ³	943	3,487	97	339	5	25
Iron ore ³	127,954	23,930	148,768	27,093	159,506	29,942
Lead conc. ³	31	1,897	43	2,194	—	—
Lithium	—	—	—	—	—	—
Amblygonite conc. ³	646	31,446	121	3,213	1,835	39,700
Eucryptite	—	—	56	1,200	388	6,940
Petalite ore ³	13,524	67,620	9,934	48,987	13,166	65,830
Lepidolite ore ³	84,599	302,396	93,545	380,767	64,699	323,445
Spodumene ³	4,445	17,271	5,599	19,536	5,238	20,952
Magnesite ³	8,611	12,917	2,910	4,365	—	—
Manganese ore ³	816	408	1,785	893	2,512	1,256
Mica block ⁴	123,214	35,650	70,044	23,787	107,730	36,559
Nickel ore ³	200	8,398	359	21,020	17	425
Tantalum conc. ³	14,66	21,708	38,48	41,762	48	76,809
Tin conc. ³	566.9	262,370	47.44	19,461	48	19,424
Tungsten conc. ³	264	168,133	167	91,602	95	22,593

1. Fine ounces. 2. By government. 3. Short tons. 4. Pounds.

monds remaining on similar levels. The outlook for chromite is uncertain due to difficult trading conditions.

Southern Rhodesia

The year 1958 was not particularly notable for Southern Rhodesia's mining industry. However, despite the depressed state of the metal market, no major companies ceased operations, and a remarkable amount of exploration continued. Nine exclusive prospecting reservations were granted and 2,404 new blocks of claims staked.

Gold continued to be the main center of interest showing an increase in total output from 536,849 fine ounces in 1957 to 554,838 in 1958. Principal producer was the Cam and Motor mine of the Lonrho group which is now 6,544 feet below surface.

Several of the larger groups also turned their interest toward gold, and it is known that properties were investigated by Rio Tinto, New Consolidated Goldfields, and others.

There was a marked increase in production of silver, from 74,000 ounces in 1957 to 264,630 ounces in 1958. This came as a byproduct of the copper extraction at Messina Transvaal Development Company's Mangula mine.

Asbestos continued to be country's most valuable mineral, although there was a drop of £500,000. The Shabani mine awarded a contract for stripping of 1,000,000 yards of overburden. When completed, it is expected to expose large known reserves.

The United States demand for chromite

slackened during the year, adversely affecting the chromite industry in Southern Rhodesia and causing several small producers to cease operations. By the end of the year, however, there was some revival of interest. 60,000 acres of chrome ground were staked during the year, and by the end of 1958, 5,150 blocks of chrome ore were being held.

Copper production jumped from 3,227 tons in 1957 to 8,430 tons in 1958. Most of this came from the M.T.D. Mangula mine where a second Aerofall mill is being installed. This company was able to maintain remarkably low working costs.

The United Kingdom Atomic Energy Authority carried out an airborne radioactive survey of the Gwaii area during the year. In an effort to accelerate geological mapping, a contract was let by the government covering a 1,100-square-mile area. This was successfully completed.

South West Africa

Almost without exception, the returns of the territory's mining industry in 1958 reflected the adverse conditions in the export markets, on which it is heavily dependent. With the object of the program of expansion being reached, the output of Consolidated Diamond Mines Ltd. rounded off its upturn and then fell away on the economic factors. Modification and modernization of plant and equipment continued, but at a reduced level of capital expenditure. A larger heavy media separation unit was installed and treatment modified to improve recovery. Construction of the new greasebelt recovery section was started. On appeal, Consolidated Diamond Mines was upheld in its contention that its mining rights included the 180-mile long coastal strip between high and low water marks from the Orange River mouth to Luderitz in the north.

De Beers Consolidated Mines Ltd. initiated diamond mining operations on a small scale in one of three concession areas in the Kaokoveld. Industrial Diamonds Ltd. converted its operations in the Saddle Hill area to dredging, which may be extended to the coastal strip held

Sierra Leone Mineral Exports and Value for 1955, 1956, 1957 and 1958

Commodity	1955		1956		1957		1958	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Diamonds ¹	401,423	£1,400,478	647,797	£3,457,385	863,202	£6,615,541	1,490,037	£7,183,787
Iron ore ²	1,331,573	3,709,595	1,328,019	4,003,016	1,444,542	4,265,982	1,420,436	4,359,981
Chromite ²	17,750	192,331	18,774	194,630	16,378	170,198	11,211	114,847
Gold ³	200	2,542	400	4,741	(4)	(4)	(4)	(4)
Total value:		£5,304,946		£7,659,772		£11,051,721		£11,658,615

1. Metric carats. 2. Metric tons. 3. Troy ounces. 4. No returns available.

Production Sales and Sales Value of Important Metals and Minerals Produced in South West Africa in 1955, 1956, 1957, and 1958*

Commodity	1956 Production	1956 Value	1957 Production	1957 Value	1958 Production	1958 Value
Diamonds ¹	988,039	£19,059,077 ⁸	996,610 ²	£15,912,796	903,576	£13,989,707
Lead ³	221,361 ⁵	14,521,845	86,946	—	82,535	8,136,621
Copper ⁴	—	—	29,835	(8)	30,818	(8)
Zinc ⁴	—	—	62,000	(8)	44,728	(8)
Manganese ore ⁶	57,262	610,172	89,661	1,026,442	103,050	1,361,389
Lithium ore ⁶	5,645	63,906	6,743	97,014	8,973	57,300
Silver ⁴	1,632,287	—	1,789,323	(8)	1,719,990	(8)
Tin conc. ³	449	180,457	634	289,000	208	93,200
Cadmium ³	—	—	1,420	(8)	1,344	(8)
Beryl ore ⁴	454	46,563	386	37,020	246	29,227
Germanium ⁸	10	—	—	(8)	7	(8)
V ₂ O ₅	N.A.	N.A.	505	N.A.	534	N.A.

*Records of Government Mining Engineer. 1. Metric carats. 2. 903,576 carats gem stones. 3. Short tons. 4. Troy ounces. 5. Estimated. 6. Total lead, zinc, copper concentrates. 7. 713,191 carats gem. 8. In complex concentrate. N.A. Not available.

by the associated Diamond Dredging and Mining Company, as well as inland terraces at or below sea level. Dredging would substantially reduce costs to the order of 12 pence from 43½ per load for conventional methods. The Diamond Dredging company secured prospecting and mining rights over the coastal strip seawards from the high water mark, 180 miles northwards from the Walvis Bay area. This same company acquired the controlling interest in Moly-Copper Mining and Exploration Company, which has a substantial shareholding in Lorelei Copper Mines, has mining rights north of the Orange River and east of the Consolidated Diamond Mines property, and extensive prospecting rights adjacent to the Lorelei holdings.

Tsumeb Corporation Ltd. enlarged its flotation circuit. S. A. Minerals Corpora-

tion suspended production of manganese ore in the closing stages of the year, but development was continued to build up the ore reserves. The previously worked Khan copper mine in the Swakopmund area was reopened for small scale production.

Tanganyika

Great progress was made during 1958 in all sections of the Tanganyika mining industry and mineral production made a record contribution to the country's economy with a value of over £6,000,000. This increase of more than £1,000,000 over 1957 was largely due to expanded diamond production. Increased production was also recorded in all other major minerals with the exception of sheet mica,

raw gypsum and building minerals.

A 1,000-ton per day mill was under construction at the new tin property at Kaborishoke in Karagwe at year's end, and a 750-ton mill was nearly completed at the Kiabakari gold mine.

The Tanganyika Corundum Corporation Ltd. commenced investigation of claims in the Masai District containing ruby corundum crystals associated with zoisite. Some of the former are of high quality and development of the deposit with experimental exports of samples for jewelry was commenced.

In January, 1958, the death occurred of Dr. J. T. Williamson, discoverer and owner of the famous Mwadui diamond mine. The entire share capital of Williamson Diamond Mines Ltd., and control of its subsidiary gold mine at Buhemba, was acquired in August by a fifty-fifty partnership of the Tanganyika Government and De Beers Consolidated Mines Ltd. Production from the enlarged treatment plant at Mwadui set a new record in 1958 with a total of 515,762 carats worth £4,391,000 being exported.

In general, gold mining throughout the Territory was restricted by the fixed price, but there was a slight increase in production. This contrasts with a steady decline in output for the previous three years. Final figures are estimated to show that some 66,000 ounces of gold were produced, valued at £830,000. Recovery from lead concentrate smelting at Mpanda mine produced about 10,000 ounces of gold and 500,000 ounces of silver during the year.

Geita, the largest gold mine in East Africa, produced more gold than in 1957

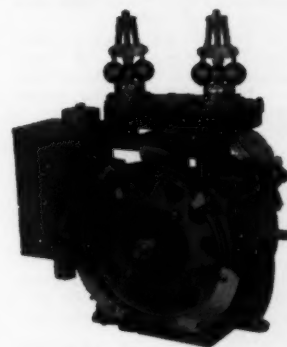
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Africa

Production and Export of Metals and Minerals in Tanganyika and Their Value in 1955, 1956, 1957, and 1958

Mineral	1955		1956		1957		1958 ¹	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Diamonds ²	322,607	£3,199,437	357,538	£2,855,273	372,738	£3,287,782	515,762	£4,391,000
Gold (refined) ²	68,892	864,279	59,293	741,582	54,088	678,287	66,000	830,000
Gypsum (raw) ⁴	7,812	16,285	9,450	18,167	9,510	17,998	N.A.	N.A.
Kaolin ²	48	507	10	105	—	—	N.A.	N.A.
Lead concentrates ²	8,822	790,000	14,251	1,210,332	12,625	882,477	13,501	972,000
Lime ⁴	955	4,471	782	3,476	484	2,424	N.A.	N.A.
Magnesite ⁴	329	820	243	597	254	635	N.A.	N.A.
Meerschaum (crude) ⁴	4,50	227	6	290	4	177	5	N.A.
Mica (sheet) ²	63	68,083	57	58,734	67	69,474	48	N.A.
Silver (refined) ²	43,292	13,990	35,020	11,504	20,520	6,739	13,501	N.A.
Tin concentrates ⁴	35	29,114	21	11,741	20	10,755	262	N.A.
Tungsten concentrates ⁴	24	17,625	15	10,929	—	—	—	—
TOTAL (Exports only)	—	£5,097,924	—	£5,016,268	—	£5,041,955	—	—

1. Estimated. 2. Metric carats. 3. Fine ounces. 4. Long tons. N.A. Not available.

despite financial difficulties and metallurgical problems encountered in the early part of the year. The increased output came from a reduced tonnage of ore treated, emphasising the success with which the technical problems were overcome.

There was some revival of interest in the possibility of gold from the Musoma area where sporadic working has been carried on in the past. Buhemba mine worked normally through the year and a considerable increase in production from Kiabakari is expected when the new mill is commissioned.

Exports of mica declined by 18 tons (worth £18,000) in comparison with 1957, the total amount sold being 488 tons.

Production of tin from the Kaborishoke mine was suspended during the construction of the new mill, expected to come into production in early 1959. Despite a serious water shortage in the Karagwe area, small tin producers increased their output slightly, exporting a total of 26.2 tons of cassiterite.

Uruwira Minerals Ltd. exported 13,501 metric tons of lead-copper concentrates to a value of some £972,000. This was a small increase over 1957.

Increasing demand for tobacco pipes was reflected in the five tons of meerschaum produced from their Masai District deposit by the Tanganyika Meerschaum Corporation Ltd.

Mbeya Exploration Co. Ltd. continued pilot plant investigation and production of sample quantities of columbite concentrates from the Panda Hill property. No decision on full scale production at this deposit was taken.

Prospecting work throughout the Territory was active in 1958. A total of 34,548 square miles was held under exclusive licenses, the Western Rift Exploration Co. Ltd. having a single area of 34,000 square miles.

South of Arusha, a large phosphate deposit was discovered by New Consolidated Gold Fields Ltd. and beneficiation research was commenced.

Mining and exploration activity in general remained on a sufficient scale to give grounds for optimism as to the future of the industry in Tanganyika.

Tunisia

Production of lead ore which had remained stable in 1956 and 1957, wavered somewhat in the fourth quarter of 1958,

and finally reached about 1,100,000 tons, compared with 1,182,000 tons in 1957.

The anticipated revival of lead and zinc metal production was not realized. Zinc output totaled 6,100 tons for the year, as compared with 6,600 in 1957, and lead output totaled 35,000 tons, as compared with 37,000 in 1957.

After a slight setback because of floods, the production of phosphate rose to about 2,200,000 tons, compared with 2,067,000 in 1957. Production of super phosphate surpassed 100,000 tons, an increase over 99,200 tons in 1957. There was a small amount of mercury produced, 150 kilograms.

Union of South Africa

While there was a further advance in gold output in 1958, comparative statis-

tics indicated rounding off of the uptrend, due to declining production by the older mines, offsetting the higher output and grade of the new mines in the southwestern Transvaal and Orange Free State.

Over 1958, most of the gold mines recorded increased costs per ton and slightly less than half recorded lower costs per ounce. The position of the marginal mines has been and is being studied with the objective to prolong operations as long as possible, to stagger closures and thereby avoid local economic dislocation. By 1966, Witwatersrand gold output will decline to about 3,500,000 ounces from 8,700,000 according to estimates.

To encourage new exploration, last year's Governmental budget provided that attendant costs incurred by mining companies could be set against general income—a measure which also encourages these companies to continue in existence. The southern Free State region was initially surveyed for possible mineral deposits. Drilling in the Waterpan Block (south of the West Rand) was completed by Johannesburg Consolidated Investment with favorable results. Drilling was continued in the general Potchefstroom area, where interest again moved north to the Ventersdorp-Coligny zone. Johannesburg Consolidated Investment, Anglo-Transvaal, and New Witwatersrand companies combined in a broader agreement to continue exploration in the Doornkop area of the Roodepoort district, West Rand. Preparations for drilling in the Reitz area of the northern Free State were reported. Greater interest was expected to be forthcoming in exploring further the area immediately south of the Vaal River, opposite the Buffelsfontein mine; in the deep-level zone south of the St. Helena-President Brand-President Steyn mines and in ground adjoining the Merriespruit mine.

An important factor in the year's operations of the new mines was grade beneficiation and expansion of effective treat-

Metal and Mineral Production for the Union of South Africa in 1954, 1955, 1956, 1957, and 1958*

Commodity	1954 Production	1955 Production	1956 Production	1957 Production	1958 Production	1958 Value
Gold ²	13,237,119	14,601,404	15,896,693	17,030,737	17,656,447	219,160,693
Diamonds ²	2,891,264	2,628,917	2,585,728	2,578,975	2,702,250	2,747,414
Silver ²	1,320,060	1,461,336	1,582,045	1,767,472	1,795,384	567,881
Osmiridium ²	6,482	7,094	6,586	5,361	4,811	82,229
Copper ²	49,134	49,239	51,253	50,959	54,869	8,532,853
Tin ²	2,827	2,147	2,887	2,915	2,892	286,416
Antimony conc. ¹	16,277	24,834	24,897	17,546	12,859	716,732
Beryl ore ¹	192	137	133	711	462	49,769
Bismuth ore ¹	7	0.16	580	220	—	—
Chrome ore ¹	503,955	597,372	690,855	733,616	696,061	2,918,580
Iron ore ¹	2,060,501	2,203,429	2,375,497	2,293,103	2,438,713	1,919,497
Lead ore ¹	230	758	1,340	1,835 ⁴	71	2,267
Manganese ore ¹	594,517	649,475	768,400	787,883	934,103	5,212,640
Tungsten conc. ¹	373	646	304	262	76	11,009
Andalusite ¹	14,152	19,359	30,244	17,799	14,587	77,288
Asbestos ¹	102,455	119,698	136,521	157,465	175,643	9,573,348
Barite ¹	2,058	1,892	2,713	3,369	2,721	10,376
Corundum ¹	1,443	834	2,068	1,546	2,118	46,462
Fluorspar ¹	14,262	32,839	35,065	35,106	48,251	268,679
Graphite ¹	1,164	1,829	1,862	1,750	875	11,446
Kaolin ¹	13,474	11,725	11,621	12,823	26,592	52,659
Magnesite ¹	22,479	19,753	33,485	35,414	80,200	173,665
Mica ¹	4,556	3,914	2,520	2,114	2,127	15,806
Talc ¹	7,413	1,581	1,968	2,314	765	5,117
Vermiculite ¹	44,006	47,904	58,717	62,619	54,319	359,425
Platinum group metals ²	270,885	381,732	484,574	—	N.A.	4,000,000
Lithium ore ¹	—	713	—	30	—	—
Pyrite ¹	236,513	398,849	481,560	434,802	552,366	1,690,988
Uranium	—	—	—	11,398,214	12,491,337	52,012,263
Vanadium	—	—	—	16	599	451,860

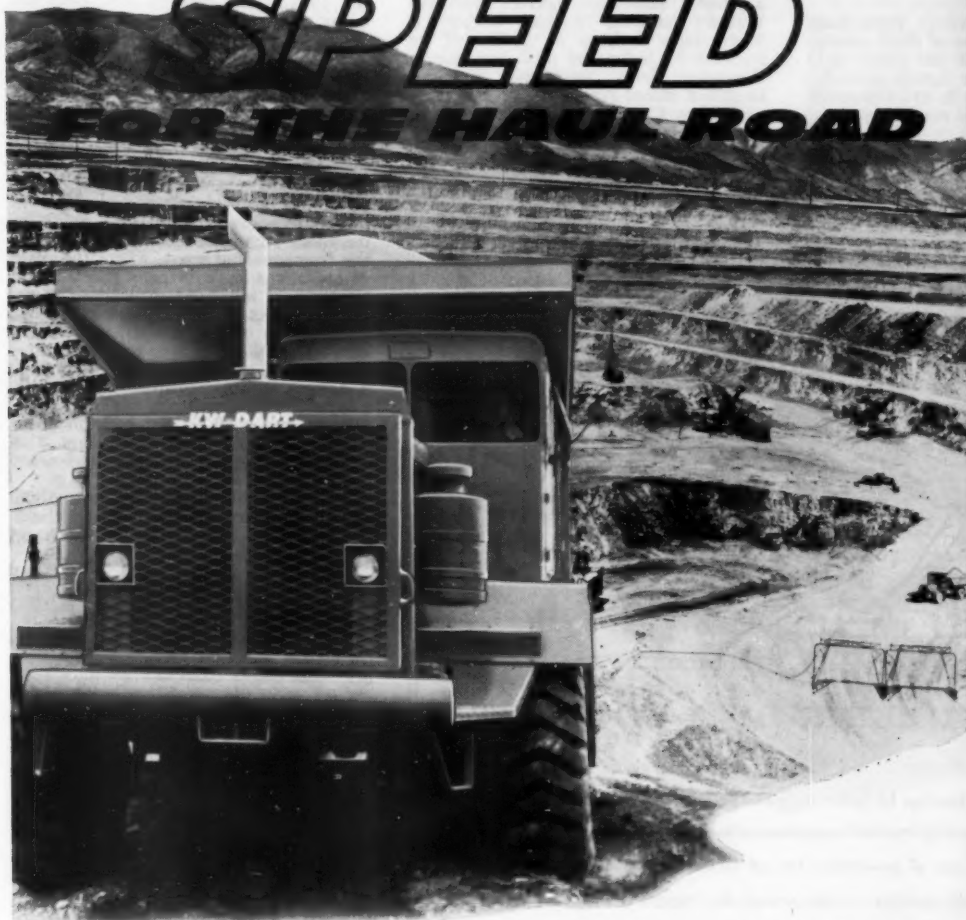
*Records of the Government Mining Engineer. Value does not always accurately reflect production because in one year all production may not be sold; in another year sales may include previous year's production. 1. Short tons. 2. Fine ounces. 3. Metric carats. 4. Metal and concentrate. 5. Estimated. N.A. Not available.

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ment capacity by intensified waste sorting on surface, which also affected economies in uranium operations. Apart from this beneficiation, Harmony, F. S. Geduld, Western Holdings, Loraine (through its higher grade Riebeeck section), St. Helena and possibly Buffelsfontein, appear the most likely to raise their mill grades further as operations are extended.

Of the non-producers, Winkelhaak completed its first phase of shaft sinking; commissioned its plant for initial gold output. Western Deep Levels recorded fast progress in sinking its two twin-shaft systems in the shallower northern section,

and these may eventually be connected with the deep level workings of West Driefontein and Blyvooruitzicht. Zandpan initiated sinking its first shaft.

During 1958, any expectation of an immediate expansion and extension of the uranium project was ended by the imposition of a ceiling output sales quota of 6,200 tons of U₃O₈ a year, excluding the additional Harmony contract with the United Kingdom nuclear authorities. Slight sales declines in 1959 will be recorded by individual producers, except Dominion Reefs, the joint Welkom-President Brand-President Steyn-Loraine-Freddie's Consolidated project, Harte-

beestfontein, Virginia, West Rand Consolidated, the Randfontein-East Champ-project, Blyvooruitzicht, which have slightly increased quotas, and in particular Harmony. The aggregate output capacity of the individual plants exceeds the aggregate quota.

A late rally in 1958 diamond sales lifted the year's total value above that for 1957. Quiet concern had been felt about the future relative position of South Africa as a diamond producer. To maintain and, if possible, improve this position, large scale prospecting was advanced by the two major producers—De Beers and the Government. In the Kleinsee Annex area of Namaqualand, the former's prospecting disclosed 6.75 carats per 100 loads in a lease area of 20,000 claims, where production was planned. The company was also planning exploration in other areas of Namaqualand. South of the State Diggings at Alexander Bay on the Namaqualand coast, where the scale of operations were being expanded, the Government advanced exploration in an extensive tract of Crown Lands. Generally in its mines in the Kimberley area, De Beers Consolidated mines is extending use of block-caving methods of mining. A new, centralized treatment plant with a handling capacity of 21,000 loads a day was commissioned to deal with ore from all the company's Kimberley mines. The program is expected to raise efficiencies and effect economies.

Especially in the export markets, 1958 was a disappointing year and declines were widespread in output and value.

Asbestos: Particularly in physical terms and in production, asbestos returns were more than maintained. During the year, the long-term outlook for South African production was described as satisfactory, providing higher costs did not force selling prices to uncompetitive levels.

In the Pietersburg area, (amosite and Transvaal blue), a major group acquired and consolidated under single control several small producers. Another important group increased its holdings in the area and expanded output. Another company initiated exploration of the Graskop deposits.

Manganese: Generally supply and transport facilities were being expanded at a time when exports were declining. During 1958, one of the two major producers acquired a new lease area. The other initiated the establishment of a new mine on a new lease area, and capacity output is scheduled for mid-1959. A number of small producers in the Postmasburg area were merged under centralized control. At Cato Ridge (Natal), two furnaces for producing ferro manganese were being installed with a further six furnaces scheduled for the next 15 years or so.

Chromite: Adverse conditions in export markets were not relieved, and production contracted on the suspension of scaling down of output by some producers. Producers with long-term contracts appeared to maintain the level of their operations. One company extended its chromite interests.

Copper: In the Cape, the O'okiep Copper Company scaled down operations to 83 percent of capacity owing to the metal market conditions, and placed its immediate capital expenditure program on a



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priority basis; its ore production capacity was expanded to the rate of 150,000 tons a month. The Messina (Transvaal) Copper Company introduced further economies to offset metal market conditions and incorporated electronic control equipment in its Transvaal mill.

Platinum: Rustenburg Platinum Mines reduced output to the level of sales, which amounted to 50 percent of the 1956-1957 monthly average due to adverse market conditions. These militated against commissioning additional plant capacity installed. Transvaal Consolidated Lands' platinum property remained on a caretaking basis.

Iron ore: Production again advanced mainly in line with expanded ingot steel output capacity by the major producer, S.A. Iron and Steel Industrial Corporation.

The Phosphate Development Corporation completed lengthy test runs at its flotation plant on its low-grade copper ore, and resumed output of igneous phosphate concentrates. Phosphate mining operations were extended: sale of the corporation's copper deposits was being negotiated. Extensive and unusually consistent deposits of calcium-magnesium montmorillonite (bentonite) were discovered, identical with similar deposits in the United States. Extensive, high grade kaolin deposits in the Bitterfontein area of Namaqualand were opened up to supply domestic and export markets. Commercial production of abrasive equipment is being considered following favourable tests of Transvaal corundum. Consolidated Murchison (antimony) curtailed operations due to market conditions. Exploration, begun in sections between known ore bodies with promising results, was scaled down; but milling was progressively stepped up as the year progressed.

Umgagbaba Minerals initiated production on the Natal south coast with projected output rates of 100,000 tons of ilmenite a year, 10,000 tons of zircon, and 7,000 tons of rutile.

Uganda

Copper continued as the outstanding mineral export from Uganda in 1958. All copper production came from Kilembe Mines, Limited. Total value for the year was £2,137,000, an increase of £600,000 over 1957. The projected capacity increase at Kilembe from 45,000 tons to 60,000 tons of ore per month is now scheduled for completion in 1959.

Comparative Value of Mineral Production in Uganda in 1956, 1957 and 1958

Value in £ Sterling

Commodity	1956	1957	1958
Copper (blister)	41,000	1,500,000	2,137,000
Tungsten	128,000	142,000	5,000
Tin	19,000	30,000	27,000
Beryl	14,000	9,000	7,400
Gold	3,000	2,000	3,500
Columbium-Tantalum	3,800	4,400	3,000

As forecast in 1957, the continuing low prices for wolframite resulted in a complete shutdown of normal production and

a nominal amount only was exported. Towards the end of 1958 a slight recovery in the market price gave hopes that the level for economic production may again be reached and that some of the small producers may reopen.

The most active operator in the Ki-gezi/Ankole tin field was the Rwaminyinya mine, but despite an output increase from this property, total tin value for the year was below that for 1957.

Geochemical prospecting from the Kitaka lead property was carried out in conjunction with a drilling program. The ore contains some recoverable gold and extensions of the known ore bodies were

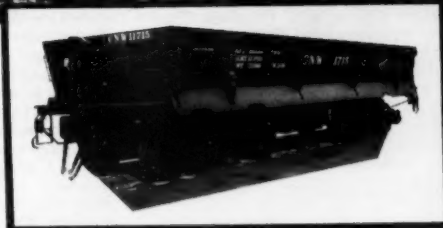
sought.

Beryl, tantalite-columbite, and bismuth ores were also produced in small quantities. A buying contract for beryl from the United Kingdom Atomic Energy Authority is expected to revive interest in this metal.

With the exception of copper, the general picture of Uganda mineral production in 1958 was a declining one. This is unlikely to improve unless mineral prices undergo a marked upward trend. The possibility of an important unknown ore body being found cannot be overlooked, but there are currently no reports to justify optimism in this connection.



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Burma

During 1958, the Burma government was seriously concerned with the drop in mineral production in the Tavoy district, and the loss of foreign exchange, so badly needed. In November, U Ba Htun, president of the Mineral Resources Development Corporation, which handles mining interests for the government, invited Tavoy mine owners to a conference to explain the methods the government proposed for aiding mine owners in rehabilitating their properties. In December 1958, it was announced that U Hla, deputy manager of MRDC, had been charged with the responsibility for rehabilitating the mines, and that he would visit mines in the Tavoy district.

The situation had indeed become critical in Tavoy. Tavoy Tin Dredging Corporation, for example, passed a resolution in November calling for liquidation of the company. This had been one of the last firms in Burma to produce tin by dredging. One problem has been the many difficulties encountered by mine operators who wished to mechanize their operations. In some instances, there was refusal by government authorities to issue the necessary import licenses and to release the necessary foreign exchange for spare parts for the machinery used. In some cases, machines have been reported idle for want of a small replacement part.

Mawchi Mines Ltd. was attacked by insurgents again, resulting in destruction of the mines' stores and a loss in all underground spares and supplies. Tin-wolframite production was restricted until replacements could be obtained, and, at last report, the mine was still shut down. A group of stockholders in London succeeded in unseating the directors of the firm. There was a difference of opinion over what should be done with £450,000 received from the Burmese government under a Joint Venture Arrangement.

There was a report during the year that the West German firm of Krupp would survey the iron and coal deposits in Burma, reportedly financed by a free gift of \$50,000 from the West German government. The area selected for the iron survey was Panquet in the Taunggyi district where preliminary explorations had located a deposit of high-grade ore to a depth of 250 feet. Nothing further was reported on this.

The Burma Corporation (1951) Ltd., a joint venture of Burma Mines Ltd. and the Burma government, conducted some geological exploration and diamond drilled in the concession area within the main Bawdin mine lease. A regional

aerial survey of the 555-square-mile district held by the firm was also underway.

Anglo Burma Tin Corporation (1956) Ltd., another joint venture company, operated during the year. The firm reported that a higher production could have been achieved except for the constant bursting of pipelines and stoppage of bulldozer operations because of a lack of spare parts. The firm may have to increase its capital in order to replace the pipelines and cope with rising costs in labor and materials.

Cyprus

Mining companies in Cyprus operated virtually at capacity in 1958 and exports of minerals showed little change.

The Hellenic Mining Company Ltd. continued operations at its three mining leases of Mitsero-Agrokipia, Kalavassos-Asgata, and Kambia-Sha, and also carried out prospecting work in some of the 27 areas for which the company holds prospecting permits.

Production of pyrite for shipment from Vassiliko reached a total of 323,544 long tons. Exports were 254,631 long tons to the Federal German Republic, and 68,708 to Italy, a total of 323,339 against 312,302 in 1957.

Development work involved the removal of 2,700,000 cubic yards of overburden in the Mitsero-Asgata area and another 2,800,000 cubic yards at Kambia-Sha. The company's two ore beneficiation plants at Mitsero and Vassiliko were in operation throughout the year. The average number of men employed during the year was 1,190.

A quantity of 27,067 long tons of gypsum rock were exported by an associate company from Vassiliko during 1958. The same company exported 768 tons gypsum plaster, and 680 tons of bentonite.

The Cyprus Mines Corporation of Los Angeles, California operated its Mavrouvouni mine throughout the year while holding its Skouriotissa, Mathiati, and Apliki mines in reserve. Somewhat less tonnage of ore was mined and milled than in 1957—817,710 dry long tons in 1958 compared to 923,831. Production details are shown in the table.

Cyprus Asbestos Mines Limited increased fiber output to 16,409 short tons from 15,028 in 1957. This was accomplished by treating a slightly smaller tonnage of higher grade ore—1,409,133 in 1958 compared to 1,421,703. The company's leased area is at Amiandos on Troodos Mountain.

The Cyprus Sulphur and Copper Co. Ltd., mined about 90,000 tons of pyrite from the Kinoussa open pit and also pro-

Exports of Minerals From Cyprus in Long Tons For 1956, 1957, and 1958

Mineral	1956	1957	1958
Iron pyrite	821,727	762,501	819,835
Cupreous pyrite	64,455	226,334	228,821
Cupreous concentrate	119,211	139,192	115,125
Cement copper	3,700	3,900	4,068
Chromium ore	5,826	5,070	11,840
Asbestos	12,505	11,886	13,118
Gypsum rock	25,424	41,687	27,067
Gypsum calcined	3,023	1,257	2,722
Umbers	4,748	4,317	3,885
Bentonite			680

Mineral Production of Cyprus Mines Corporation in 1955, 1956, 1957, and 1958

Commodity	1955	1956	1957	1958
Copper concentrates ¹	86,351	101,689	112,434	99,578
Cement copper ¹	3,225	3,094	3,431	2,958
Cupreous pyrites ¹	100,003	142,732	176,255	193,180
Gold in copper concentrate ²	6,467	7,163	8,111	7,915
Silver in copper concentrate ²	62,381	69,988	85,886	71,326
Flotation pyrite ¹	500,778	587,723	529,871	434,304

1. Dry long tons. 2. Fine ounces.

duced some copper concentrates and copper cement. Exports of pyrites were nearly 70,000 tons in 1958, against 64,000 tons in 1957.

The Cyprus Chrome Company Limited, operated the Troodos mine and produced nearly 9,000 tons of concentrate. Exports were 11,480 tons.

The Berdy Mining Co. Ltd., of Larnaca, worked the Troulli mine and produced some copper concentrate and pyrite. It is understood that about 300 tons of copper concentrate was exported.

Ceylon

The graphite mining industry in 1958 passed through one of the most difficult phases in the history of mining in Ceylon. There was a further drop in the exports of about 31 percent as compared with the previous year. The large mines were on restricted production or a maintenance basis.

Ceylon Graphite Exports From 1951 Through 1958 In Long Tons.

Year	Quantity
1951	12,621
1952	7,659
1953	7,218
1954	7,755
1955	9,878
1956	9,207
1957	8,190
1958	5,637

The principal graphite mines continued to be worked by Messrs. Bogala Graphite Ltd., Kahatagaha Mines Co. Ltd. and H.L.de Mel & Co. Ltd.

No figures for the production and value of gemstones are available. However, gemstones mining continued and it may be estimated that about 1,500,000 Rupees worth of gemstones are produced annually. The principal varieties are the ruby, sapphire and their star varieties, cat's eye, zircon, topaz, aquamarine, and moonstone.

The experimental plant for the recovery of monazite from beach sands continued to work throughout the year. Only

Production of Metals and Minerals in Burma For Key Years From 1939 to 1958

Year	Silver ¹	Tin Concentrate ²	Wolframite Concentrate ³	Lead ⁴	Zinc Concentrate ⁵	Copper Matte ⁶
1939	6,175,000	5,441	4,342	77,180	59,347	7,935
1948	415,099	1,768	378	11,596	2,943	115
1949	75,199	1,469	278	1,481	—	38
1950	—	1,750	165	371	—	—
1951	280,270	1,295	483	5,035	—	254
1952	54,783	1,306	792	9,093	4,275	134
1953	645,970	1,114	767	9,846	6,275	80
1954	1,278,289	816	443	22,561	11,283	224
1955	1,537,895	673	578	28,015	14,423	358
1956	1,358,513	1,193	1,438	14,885	13,953	379
1957	1,238,259	1,140	948	13,892	14,922	269
1958 ^a	1,206,339	1,752 ^a	601 ^a	13,577	17,772	256

1. Ounces. 2. Metric tons. 3. Long tons. 4. 1,788 tons mixed wolframite-tin concentrates exported. 5. 143 tons mixed concentrates exported. 6. Estimated.



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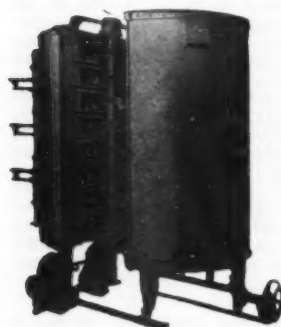
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LEAD ORES	DIATOMITE
SODA ASHES	LIME SLUDGE
FULLERS EARTH	MAGNESIUM
CARBON	CLAY GRANULES
PYRITE	ANTIMONY

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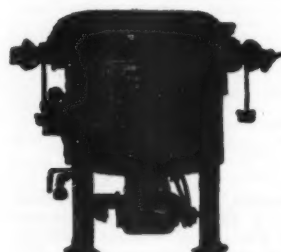
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Asia

No. 2 grade monazite assaying 70 percent rare earth oxides was produced. A stock pile of about 415 tons await further treatment. The Exolon magnetic separator has been installed and it is hoped to produce No. 1 quality monazite in the near future. It is also proposed to install a new pneumatic table and grader at an early date.

Hong Kong

The most active mining operation in Hong Kong during 1958 was at the Ma On Shan magnetite iron ore mine, where a monthly average of 9,000 tons of concentrate was shipped, mainly to Japan. The mine is now entirely an underground operation. A wet magnetic dressing plant beneficiated the ore to a 56 percent grade.

The continued low world price of tungsten kept tungsten mining at a minimum; only 39 tons were reported sold. However, the mine at Needle Hill continue to work throughout the year with a skeleton staff and stockpiling was steady, although small.

Output of lead was very small. The entire production came from the Lin Ma Hang mine, a high-grade deposit. Several overseas concerns showed interest in the mine during the year. Negotiations continued with the Hong Kong government for the renewal of a mining license to operate the lead and zinc deposits in the Lam Tsuen Valley.

Graphite from the mine on West Brother Island was shipped mainly to the United States. The mine was modernized with the installation of an electrical power plant. The graphite averaged about 80 percent

Production of Metals and Minerals in Hong Kong in 1957 and 1958

Commodity	1957	1958
Iron ¹	94,182 ²	105,125 ²
Lead ¹	130	36
Graphite ¹	3,303	1,934
Kaolin and Clay ¹	6,961	7,620
Quartz ¹	—	4,484
Feldspar ¹	—	1,653

1. Metric tons. 2. Concentrate.

fixed carbon content.

Increased interest was shown by local prospectors in the beryl deposits at Devil's Peak and Customs Pass. A representative of a U.S. company spent some time investigating the possibilities of the deposits. Foreign observers also showed interest in iron and lead operations in the country.

Israel

A steady increase in mineral production occurred in Israel in 1958. Particularly noteworthy in this respect were greater tonnages of potash, phosphate, quartz sand, ball and fire clay, marble and bromine.

At the Dead Sea Works Ltd. production of muriate of potash rose from 78,000 tons

in 1957 to 118,000 tons in 1958. Of this amount 91,000 tons was for export. In addition, byproducts consisting of sizeable tonnages of high purity NaCl as well as less amounts of MgCl₂ and CaCl₂ were produced. Most of this tonnage was stockpiled, a modest amount of NaCl going into the domestic market. Preparatory to expanding production, a comprehensive drilling program in the south end of the Dead Sea was completed, providing foundation information for future dikes to provide additional pan area.

Output of beneficiated phosphate rock (Negev Phosphate Co. Ltd.) assaying 28.5 percent P₂O₅ rose from 150,000 tons to 238,300 tons in 1958, 61,600 tons for export and the remainder being consigned to the superphosphate plant in Haifa. The Oron plant in the Negev desert continued to be the only producer. A flotation mill was being erected at this plant to treat fine rejects from the air-separation operation. Annual capacity will be 100,000 tons input (20 to 22 percent P₂O₅) making 30,000 tons of 31 percent P₂O₅ and 70,000 tons of reject of about 17 percent P₂O₅ content. Water requirements are 4,000 tons per day with a loss from evaporation and otherwise of 200 to 400. Water is to be reused, and will be piped in from a distance.

The Negev Ceramics Ltd. flint clay mine in Wadi Ramon was being developed by an incline to a depth of 196 meters on a 10 to 12° slope. To date no commercial production has taken place. This clay is of good refractory grade, and determination of available reserves is in process.

The Timna Copper Works near Eilat is in production, after experiencing a series of mechanical and metallurgical difficulties in the running in periods. Throughput was somewhat less than 50 percent capacity, and by year's end approximately 600 tons of cement copper had been produced. The mill is being supplied entirely from the open pit workings, but it is expected that underground production will begin during the current year, as the west incline is starting underground at the time of this writing.

Gypsum production was derived from two main areas in 1958, namely the Galilee area and the Wadi Ramon. The former, until a few years ago produced the bulk of domestic supply for the cement industry. The Ramon Gypsum works, also a supplier of raw gypsum was in process of erecting a calcining plant of 60 tons per day capacity.

India

Mineral industry highlight in India in 1958 was the blowing in of new blast furnaces in October by two private companies. Tata Iron and Steel Company's new furnace has a capacity of 1,650 tons of pig iron daily and Indian Steel Company's 1,200 tons. Construction of the government steel plants at Rourkela, Bhilai, and Durgapur continued.

Three new ferromanganese plants were commissioned at Dandeli (Mysore), Girividi (Andhra), and Joda and Raigada (Orissa). All local needs will be supplied by these plants and 50,000 tons per year of standard grade ferromanganese will be available for export.

Japan showed continued interest in the purchase of Indian iron ore. An agreement was concluded between the government of India and Japanese steel companies in August for the export of 1,600,000 tons of iron ore in the next year. Under the agreement, India will export 1,400,000 tons of ore containing 65 percent Fe. Further agreement was concluded by Japan to mine and develop the Kiriburu iron ore deposit in Orissa for the export of up to 2,000,000 tons a year beginning in 1962. During 1958, India exported 1,200,000 tons of iron ore to Japan. There was less iron ore shipped to European countries compared with 1957.

India has proved adequate reserves of pyrite at Amjor (Bihar) to meet the deficiency of sulphur resources. Proposals were considered to establish a sulphur recovery plant as well as to manufacture sulphuric acid from Amjor pyrite. The plant would be located near the mine.

Iran

Mining activities in Iran increased considerably during 1958 thanks to governmental efforts to encourage private investments. The industrialization of the country has taken a big step forward since the Ministry of Industry and Mines started to give loans for industrial projects, covering up to 50 percent of the required capital. The loans carry a percent interest as compared with the normal bank discount of 10 to 12 percent. Furthermore, all industrial projects are exempted from taxes during their first year of operation. During 1958 the equivalent of \$50,000,000 was given to private investors which made them invest a total of \$160,000,000 of private capital.

About 20 percent of these investments have been effected under mining, mineral dressing, and metallurgy. Partly as a result of this a top record of over 300 mining licenses were issued during the year.

Iranian Mineral Production in Metric Tons in 1955, 1956, 1957, and 1958¹

Mineral	1955	1956	1957	1958
Lead ore ²	10,000	32,000	34,000	47,000
Chromite ³	27,000	43,000	45,000	45,000
Manganese	20,000	18,000	16,000	15,000
Copper	5,000	4,000	4,000	4,000
Red iron ochre	6,000	14,000	9,000	12,000
Coal	175,000	175,000	180,000	200,000

1. Estimated. 2. More than 50% Pb. 3. More than 40% Cr₂O₃.

Production of Minerals in Metric Tons in Israel From 1953 to 1958

Commodity	1953	1954	1955	1956	1957	1958 ²
Phosphate rock	23,092	58,195	71,779	115,572	151,951	238,300
Potash	4,426	18,343	15,555	45,398	78,238	118,200
Ball and fire clay	5,001	8,381	6,415	7,324	8,469	11,250
Salt	29,993	26,636	20,290	25,972	31,564	37,450
Quartz sand	12,026	11,541	12,583	15,722	16,498	24,000
Gypsum	22,250	30,200	50,000	50,000	65,000	60,000

1. From Israel Government Central Bureau of Statistics. 2. Extrapolated from January to September figures available.

ceeding 300,000,000 tons), and the Bafgh iron ores which contain as an average more than 60 percent Fe and have estimated reserves of at least 20,000,000 tons. Among other recent discoveries are a large number of lead mines in the Esfahan, Yazd, and Khorassan areas. Radioactive minerals of considerable quantities have been reported from Azartaidjan.

Mineral production showed slightly higher figures than 1957. The lead ores, most of which are exported to the Soviet Union, are produced on a constantly increased scale.

Iron and coal deposits are under development for the creation of a local steel industry. The chromite mines work at the same rate as previous years and any new projects have not been reported.

Japan

1958 was a year of readjustment and contraction. Restricted economic conditions, especially during the first half of the year, brought a decrease in domestic demand for raw materials and lowering of prices.

In February copper smelters cut production to 8,500 tons per month, or about 40 percent less than normal output. Production had been cut by 15 percent in October 1957 to 11,400 metric tons per month; before that output had been at a rate of 13,400 tons.

In March lead producers cut regular output of 5,000 tons monthly by 20 percent to 4,000 tons per month, and April made further reductions to 3,000 tons. Zinc production was reduced by 20 percent or 2,400 tons from the normal of 10,400 tons. Nickel output was cut about 15 percent.

The outlook for the nonferrous metal market in Japan was, in general, similar to the world situation. In line with the recovery of the U.S. economic recession starting in May 1958, and softening of domestic financial restrictions, the Japanese economic situation gradually improved. As a result, demand for metals increased in the second half of the year. Copper production returned to normal in November and December, except for a 40-day strike in the Osaka refinery of Mitsubishi Metal Mining and Smelting Company. Lead output returned to the normal 5,000 tons or more by January 1959, and zinc was free in December because of decreased stocks at the refineries.

Most of the Japanese mining companies conducted some foreign exploration work

Production of Ores and Metals in the Republic of Korea for 1952, 1953, 1954, 1955, 1956, 1957, and 1958

Commodity	1952	1953	1954	1955	1956	1957	1958
Gold ¹	18,636	16,100	52,250	45,654	47,200	64,400	80,200
Silver ¹	—	52,500	50,200	69,767	195,800	276,000	27,830
Copper ore ²	9,819	10,144	7,047	13,040	14,706	9,168	7,644
Electrolytic copper ³	—	199 ⁴	204,725	328,930	907,288	792,535	803,374
Lead ore	366	638	116	1,362	2,901	1,843	2,435
Bismuth conc. ²	279	260	382	407	608	363	300
Bismuth metal ³	17	299	160	115	172	149	347
Iron ore ^{2,4}	20,577	18,831	30,996	29,135	62,867	185,412	261,025
Manganese ore ^{2,5}	7,416	3,270	1,691	3,450	1,958	3,205	—
Nickel ore ^{2,6}	1,060	1,126	140	—	500	225	70
Tungsten conc. ²	3,790	7,456	3,828	2,920	3,741	3,825	3,012
Molybdenite conc. ²	11	19	19	22	25	27	68
Crystalline graphite ²	254	683	713	—	528	260	145
Amorphous graphite ²	14,806	18,744	13,200	87,900	60,586	147,341	93,926
Asbestos ²	—	—	211	60	49	87	20
Talc ²	3,764	9,483	8,326	6,240	6,297	6,600	10,106
Kaolin ²	1,766	8,723	9,457	13,462	9,387	6,622	11,565
Pyrophyllite ²	9,830	14,281	10,693	2,688	7,963	4,680	5,843
Fluorite (80% CaF ₂) ²	5,553	9,802	8,872	10,073	3,113	5,119	1,620
Monazite ²	85	—	1,005	508	187	355	322
Barite conc. (98% Ba) ²	—	918	305	846	675	7	—
Zinc ore ²	—	—	—	—	831	564	699
Pyrite ^{2,7}	—	—	—	—	46	550	280
Zircon	—	—	—	—	0.44	8.45	11

1. Fine ounces. 2. Metric tons. 3. Kilograms. 4. 50 percent iron. 5. 40 percent Mn. 6. 3 percent Ni. 7. 40 percent sulphur.

in an attempt to find new ore properties. Chile, India, Pakistan, and Thailand were just a few places visited by Japanese mining experts during the year.

At home there was much expansion and discovery of deposits. Nittitsu Mining Company continued to explore the Chichibu mine in Saitama Ken. A lead-zinc ore body estimated at 1,000,000 tons was discovered in the Akaiwa section.

Nippon Mining Company confirmed a promising copper deposit in its Ogoya copper-lead-zinc mine in Ishikawa Ken after drifting in the eastern section of the mine. Proved reserves are estimated at 1,000,000 tons. Ogoya's mill is able to handle 15,000 tons of ore monthly.

Expansion of the Aina copper mine in Akita Ken was undertaken with shaft sinking reaching a depth of 128 meters by the end of the year. Mining capacity is expected to be at a rate of about 7,000 tons monthly by June 1959. Ore reserves are now estimated at more than 1,000,000 tons, and further development may prove more. The recent ore discovered contains 1.8 percent Cu, 0.8 percent Pb, 4.0 percent Zn, and 12.0 percent S. Another promising deposit was discovered northwest of the Suehiro deposit, and is estimated to contain about 1,000,000 tons of 2.4 percent copper ore.

Chyugai Mining Company discovered a gold deposit at its Seigoshi mine in Shizuoka Ken; Oppu Mining Company, a subsidiary of Mitsubishi Metal Mining Company, undertook exploration of Yatani lead-zinc mine in Yamagata Ken

and confirmed sizable reserves. Mikkaichi Zinc Smelting Company completed construction of another distillation plant. Production capacity will now be increased to 1,400 tons from the current 1,000 rate.

Mitsui Mining & Smelting Company completed expansion of its Hibi smelter in Okayama Ken and Takehara refinery in Hiroshima Ken in order to increase copper production. Hibi can now produce 1,700 tons of crude copper monthly, and Takehara will produce 1,700 tons of electrolytic copper.

Rasa Industrial Company installed a smelter at Miyako in Iwate Ken in order to produce nickel from New Caledonian ore. However, because of the unfavorable market situation, the company changed to copper smelting. Capacity is 800 tons monthly.

Republic of Korea

Mining was active in the Republic of Korea in 1958 as production of gold, electrolytic copper, lead ore, iron ore, talc, kaolin, and zinc ore increased over 1957 figures. The greatest gain was in iron ore output, much of it high grade magnetite, from 185,412 to 261,025 tons. Exploration activity was at a peak rate.

At year's end the first airborne prospecting survey ever undertaken in Korea was started. Adverse weather curtailed flying, but 3,500 miles were flown with at least one discovery made; a high grade iron ore deposit in the districts of Toju and Choongju. Flying will be continued in the spring of 1959. The Yang-Yang iron mine continued as the largest producer of iron ore. A new discovery of high grade magnetite was made in Choonghyo Ri, Kyungju City. Reserves of 60 to 70 percent iron are estimated at 1,000,000 tons. Production reached 100 metric tons per day and the first export of 1,000 tons was planned for shipment to Japan.

Exploration for uranium continued without major success. Uranium was found in graphite seams and pegmatites. Placer deposits of monazite, and zircon were sampled.

Nickel prospecting and exploration was very active. One deposit at the Sanne mine, Sanne Myun, Chulla Pukto, was sampled on the surface and assayed 0.73 percent nickel and 0.60 percent copper.

Tungsten production was maintained at 250 tons of concentrate per month by

Production of Metals and Ore in Japan in 1952, 1953, 1954, 1955, 1956, 1957, and 1958

Commodity	1951	1952	1953	1954	1955	1956	1957	1958 ¹
Copper (electrolytic) ²	40,866	94,385	91,065	106,478	113,316	126,156	142,223	123,959
Lead (electrolytic) ²	11,116	19,148	23,145	34,114	37,126	46,307	54,036	41,519
Zinc (electrolytic) ²	38,244	49,341	54,827	68,108	72,678	136,226 ⁷	138,030 ⁷	140,977 ⁷
Mercury ²	80.0	111.0	220	148.7 ⁴	172	287	423	38 ³
Antimony ²	221.2	543	1,197	264.4 ⁴	301.9 ⁴	562 ⁴	430	291
Tin (electrolytic) ²	433.4	786	858	886	1,002	1,185	1,280	1,328
Pyrite ²	2,162,344	2,567,053	2,296,389	2,677,847	2,736,143	3,097,497	3,426,237	3,193,287
Silver ²	143,320	185,722	249,210	237,342	227,400	191,814	263,823	258,422
Gold ²	176,900	209,210	233,890	9,324,147 ⁵	7,487,600	7,509,055	9,428,217	9,586,612
Titanium sponge ²	—	—	51,902	515,414	1,249,787	2,524,681	3,077,989	1,656,074
Aluminum ²	—	—	—	53,111	57,515	65,997	68,000	70,000
Nickel ²	—	—	—	—	—	5,664	7,252	3,618
Germanium ²	—	—	—	—	102,711	399,274	2,010,669	4,882,772
Sulphur ²	—	—	—	—	202,879	247,264	257,616	179,818

1. Preliminary. 2. Metric tons. 3. Kilograms. 4. Fine ounces. 5. Grams. 6. Content of Ore. 7. Total zinc slab output.

Asia

the Korea Tungsten Mining Company at its Sangdong mine. This rate of production has been maintained since the all time peak of 7,456 tons in 1953. The new chemical refinery to remove molybdenum, bismuth, and phosphorous from concentrate was nearly finished at year's end.

Malaya

The coming into force of Tin Control and Buffer Stock Regulations, which enforced on Malayan tin producers the obligations undertaken by the Federal government as a signatory to the International Tin Agreement had a very adverse effect on production which, compared to 1957, fell by 35 percent. As a result most mining companies had to curtail operations, some were forced to suspend or even windup their activities, while several others amalgamated, usually with mines controlled by the same group. These measures caused a great deal of

Production of Metals and Minerals in Long Tons in Malaya in 1955, 1956, 1957 and 1958

Commodity	1955	1956	1957	1958
Tin	61,244	62,294	59,293	38,458
Coal	206,118	182,479	152,711	66,452
Iron ore	1,466,184	2,444,570	2,972,359	2,795,261
Ilmenite	53,875	122,176	91,734	74,827
Monazite	249	631	490	428
Tungsten	106	91	50	44
Columbite	236	276	142	159
Bauxite	222,162	264,444	325,629	262,354
Gold ¹	22,838	20,252	11,157	22,484
China Clay	1,378	1,155	752 ²	—

1. Troy ounces. 2. First six months 1957.

unemployment as well as hardship for the many small-scale operators, most of whom are Chinese.

Fears that the situation would deteriorate even more as a result of Russia selling large quantities of tin to countries outside the Soviet Bloc have, however, been stilled following the understanding reached between the International Tin Council and the U.S.S.R. whereby Russia's 1959 exports would be limited to 13,500 tons as against 18,500 tons sold in this way during 1958. This announcement was made early in 1959 after the first quarter 1959 export quotas had been fixed to be on the same level (7500 tons) as existed for the last three months of 1958. It follows that there are reasonable grounds for believing that subsequent 1959 allocations will probably be on a higher level, and this should ease the situation.

Higher allocations for 1959 by the Tin Council are foreseen. Another factor which should help the mining industry generally in 1959, but tin mining in particular is that the report of the government appointed "Land Administration Commission" published in 1958 emphasizes certain reforms designed to give the industry a status in keeping with its importance, and to eliminate the interminable delays which take place in the issue of Mining Certificates and Mining Leases, as well as the imposition of unreasonable conditions. The Commission inter alia noted that "tin mining constitutes some 15 percent of the country's total annual revenue, and this amount comes from only 1.27 percent (409,794 acres) of the Federation's total area. The question of finding new reserves to replace the ton-

Number of Active Tin Producing Units in Malaya, end of December 1957 and 1958

Units	1957		1958	
	European	Asian	European	Asian
Dredges	76	0	34	0
Gravel pumping	19	578	11	322
Hydraulic mining	8	2	6	3
Open cast	2	2	0	1
Underground	2	23	1	18
Small workings ¹	0	26	1	20
	107	631	53	364

1. Without machinery.

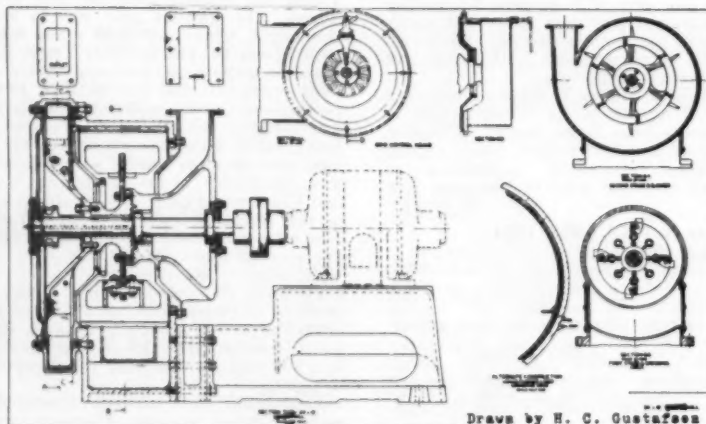
nages produced by mining was also thoroughly investigated. The Commission noted that widescale prospecting is in Malaya's interest and obstacles should be removed from the path of the genuine prospector whose services are badly needed, as there can be little doubt that substantial reserves of high-grade tin exist, particularly in areas where comparatively little prospecting has been done, viz.—both to the West and to the East of the main mining range.

Iron ore production remained on a very high level, the tonnage mined being only 6 percent short of the 1957 record output of nearly 3,000,000 tons, but plans to nearly double this figure are being actively pursued by two concerns. The Lompini Mining Company, a subsidiary of Eastern Mining & Metal Company, who operate the Bukit Besi mine at Dungun Trengganu are going to develop high-grade (62 percent) iron ore deposits in the Pahang jungle. A production of 800,000 tons in 1964 increasing to 1,500,000 in 1965 and 2,000,000 tons in 1966

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is foreseen. Another large iron ore venture was being developed by the Perak Iron Mining Co. who worked a new open-pit mine near Ipoh which is expected to start producing at the rate of 200,000 tons a year rising to 500,000 tons annually. This project also entails making a new 65-mile road, construction of a 1,300-foot jetty as well as other harbor facilities to enable ocean going carriers to load ore for transportation to Japan.

Bauxite production, which has stepped up considerably during 1957, fell again and was more in line with the level of output achieved preceding this increase.

Compared to 1957 gold output was doubled in view of the fact that production continued uninterrupted, whereas in the preceding year labor disputes at the Raub Australian Gold Mining Co. halted operations for about six months.

The report of the radio-magnetic survey of Malaya sponsored by the Canadian and Malayan governments under the Colombo Plan (referred to in previous Reviews) was completed and this comprehensive document inter alia states that considerably higher energy gamma rays, possibly indicating the existence of radioactive deposits were encountered during the survey. Evidence of iron and tin were also indicated in the Kedah, Trengganu, and Johore areas, but much field work will have to be carried out before these potentials can be fully appraised.

Turkey

The mineral industry of Turkey experienced considerable difficulties during 1958, especially in the private sector. Chrome producers, in particular, experienced dark days. Production of chrome, copper, manganese, and iron was off.

Exploration activity continued at a high level, in particular by the Mineral Research and Exploration Institute (MTA), Turkish government mining agency. MTA is preparing to carry out an aerial mineral survey covering 124,500 square kilometers utilizing magnetometer and scintillometer with financing from the Development Loan Fund. Contract for the survey was expected to be made in the Spring of 1959.

The Turkish chrome industry is seriously depressed. Chrome ore production fell off nearly 50 percent from 913,178 tons in 1957 to approximately 475,000 tons in 1958. Exports fell from 614,270 tons to 516,400 tons in the same period. Some 170 small private mines are shut down and 600,000 tons of ore are stocked at minehead and at ports.

Production of iron ore decreased from 1,164,199 tons in 1957 to 832,758 tons in 1958, mostly in the private sector since production from state-owned (Etibank) mines only fell from 509,877 tons to

480,000 tons. A survey is being conducted by the Koppers Corporation into the economic feasibility of creating a second steel making center to complement the state-owned mill at Karabuk. If considered feasible, Koppers is to recommend a suitable site.

Blister copper production dropped from 24,401 tons in 1957 to 22,530 tons in 1958 from the state-owned mines at Ergani and Murgul. The loss in production all occurred at Murgul. Drilling by MTA in the Tirebolu and Lahanos areas near the Black Sea disclosed a cupriferous pyrite orebody containing 4,000,000 tons of which 1,500,000 runs 4 percent copper. Drilling continues to delineate the downward extending limits of the ore-body.

Manganese ore production also dropped drastically from 56,719 tons in 1957 to approximately 20,000 tons in 1958. This is attributable to general unfavorable economic conditions in Turkey and restricted markets.

Etibank is preparing to develop the 7,000,000 ton deposit of borax (colemanite) at Emet discovered by MTA in 1957. Boron mineral production has been erratic over the years, but is expected to be stabilized with plans for new production facilities in the Bigadic and Kutahya areas. Principal producer has been Borax Consolidated, Ltd. However, four other producers were active in 1958.

Taiwan

Coal production in 1958 reached 3,181,000 metric tons and broke all previous records in Taiwan. Coal mining was considerably improved with the gradual mechanization of mining operations and the introduction of efficient mining techniques. Much attention has been paid to the mining of the coal resources in the deeper parts of the important coal fields and encouraging results were achieved.

Production of gold, silver, and copper decreased slightly in 1958 as compared with the previous year. The new regulations controlling the selling of ornamental gold were issued by the government to make amendments to the gold miners and to encourage gold production. Future development of gold and copper mining still depends on a steady program of exploration for unknown and rich ore deposits in the present mining districts and other prospective areas.

Pyrite output in 1958 was the same as in the previous year, but the production of sulphur was 3,246 metric tons less than in 1957. This was caused by the importation of 7,000 metric tons of sulphur from abroad which sold at lower prices than the domestic product. Process is underway to set up modern furnaces and to improve the treatment of ores by some sulphur mining companies in Taiwan with

Production of Minerals in Taiwan in 1955, 1956, 1957, and 1958

Commodity	1955	1956	1957	1958
Coal ¹	2,359,316	2,529,046	2,916,804	3,181,418
Gold ²	874,399	1,166,400	606,000	630,300
Silver ³	1,988,587	1,575,400	2,024,600	1,609,500
Copper ⁴	1,174	1,701	1,901	1,663
Sulphur	4,932	8,491	9,754	6,508
Pyrite ⁵	29,019	28,666	33,466	33,275
Graphite ⁶	695	2,073	2,500 ^a	451
Talc ⁷	5,268	6,131	7,000 ^a	3,336
Asbestos ⁸	366	101	100 ^a	42
Porcelain clay ⁹	420	3,353	4,000 ^a	71
Magnetite ¹	—	1,411	1,913	9,371

1. Metric tons. 2. Grams. 3. Estimated.

a view to reduce operation costs.

Magnetite placer mining showed a great increase and production reached 9,371 metric tons in 1958. It was used to replace a part of the imported iron ores by the iron and steel factories. Production of residual ores of limonite decreased due to dwindling of domestic demands.

Thailand

Despite the International Tin Agreement, which restricted production and export of tin from Thailand, tin was still by far the most important mineral mined in 1958. The total permissible export for the country for 1958 was only 7,350 long tons, which was only 54 percent of the 1957 production.

Without sufficient tin quotas, most dredges reduced their running time to under 50 percent of their full capacity. Some plants were closed down entirely. Several dredges including Puket Tin, Ronpibon Tin, and Peek dredge had practically worked out their leases at the end of 1958. The Australian firm of Takuapa Valley sold its dredges and property to a local Chinese company after they had failed to improve recovery.

Production of Minerals and Metals in Thailand in 1954, 1955, 1956, 1957 and 1958

Commodity	1954	1955	1956	1957	1958
Tin ¹	9,776	11,108	12,481	13,531	9,500
Tungsten ²	1,085	1,126	1,500	800	570
Antimony ³	1,390	48	20	—	—
Lead ⁴	N.A.	12,512	8,000	N.A.	1,000
Manganese ⁵	N.A.	N.A.	N.A.	N.A.	1,100
Iron ore ⁶	N.A.	N.A.	N.A.	N.A.	19,000
Lignite ⁷	N.A.	N.A.	N.A.	N.A.	100,000

1. Estimated. 2. Long tons metallic tin. 3. Long tons concentrate. 4. Metric tons concentrate. 5. Metric tons.

The initial difficulties in the operations of the new deep-sea grab-dredge of Aokam Tin were overcome. The reconstruction of the Bangnon dredge was completed at the end of the year while the construction of the new Tongkah Harbour sea dredge continued.

The only iron mine, worked by Thai Cement, supplied iron ore to the small smelter at Tah Luang.

The government consulted and sought assistance from the German firm of Krupp in the proposed development of another iron deposit near Kanburi in the central part of the country.

No large-scale mining operations for tungsten were reported. A high percentage of the reported output came from the purchases of wolframite produced by hill tribes along the Thailand-Burma frontier.

Mineral Production in Turkey From 1954 To 1958¹ in Metric Tons

Commodity	1954	1955	1956	1957	1958
Chromite, production	550,395	649,143	833,073	913,178	475,000 ^a
Chromite, export	357,178	542,803	662,556	614,270	516,400 ^a
Copper, blister	25,213	23,799	24,763	24,401	22,530 ^a
Boron minerals	14,331	42,186	33,477	27,378	46,329 ^a
Lead	—	—	—	—	2,072 ^a
Iron ore	481,520	771,979	929,854	1,164,199	832,758 ^a
Manganese	49,827	50,102	60,751	56,719	20,000 ^a
Mercury ⁴	9	29	1,079	720	928 ^a
Antimony	1,783	3,033	1,523	1,863	917 ^a
Zinc	—	1,517	3,528	6,871	5,740 ^a

1. From "Activities Of Our Mines," Ministry of Industry, Ankara. 2. Estimated. 3. Tentative. 4. Flasks.

Austria

Production of ores and minerals in Austria remained fairly stable. Iron ore output dropped slightly due to the recession of the steel and iron industry on the world market. This recession also began to effect Austria's magnesite industry during the last few months of 1958, though the production figure still shows an increase as compared with 1957. As in previous years non-ferrous metals needed governmental support due to low prices. Therefore, Bleiberg Bergwerksunion (BBU) at Bleiberg, Carinthia, restricted new mining operations. Graphite production increased 12 percent in 1958. The old-established graphite mine of Miller & Co. at Trieben, Styria, the second largest graphite producer in Austria modernized mining operations thus increasing the output in 1958 at a rate of almost 50 percent.

General outlook for 1959: Iron and magnesite mining operations will greatly depend on the situation on the world market. Very likely the slight downward trend will prevail. Not much change is expected in the field of non-ferrous metal mining. Minerals which showed increasing production during the past years apparently will continue their upward trend.

Austrian Production of Ores, Minerals, and Metals in Metric Tons in 1956, 1957 and 1958

Commodity	1956	1957	1958
Iron ore, total	3,257,887	3,495,721	3,410,381
Lead-Zinc ore	163,119	182,845	187,912
Copper ore	152,826	165,177	164,489
Antimony ore	10,356	11,023	11,198
Bauxite	22,093	22,325	23,570
Gypsum + Anhydrite	452,834	525,636	541,988
Graphite	18,685	18,921	21,154
Magnesite	1,083,635	1,172,598	1,221,193
Talcum	66,055	73,405	70,828
Kaolin	272,364	292,248	300,265
Lead conc.	6,567	7,467	7,486
Copper conc.	8,337	8,461	9,392
Aluminum	70,700	72,800	74,266

Eire

Early in 1958 low metal prices forced the only two Eire lead zinc mines out of production. However, copper mining which has not featured in the Irish economy for over three quarters of a century staged a comeback.

In October 1958 St. Patrick's Copper Mines Limited the wholly owned subsidiary of Irish Copper Mines Limited of Toronto, Canada, commenced production of chalcopryrite and pyrite concentrates in its 4,000 ton per day differential flotation plant at Avoca 45 miles south of Dublin. A system of trackless mining is employed and the ore is transported from underground up a 16 by 16 foot incline in 30 ton Diesel trucks.

The Emerald Isle Mining Company, a subsidiary of Can Erin Mining Company, also of Toronto, continued the dewatering of the Allihies copper mine near Bantry in West Cork. The old shaft was reopened and timbered and diamond drilling carried out on the 1200 foot level.

The Abbeystown Mining Company Limited a wholly owned subsidiary of Johannesburg Consolidated Investment Co. Limited, suspended production from its lead zinc (galena and sphalerite) mine in County Sligo and went into voluntary liquidation. The New Abbeystown Mining Company was formed and development was con-

tinued. By the end of the year plans were well advanced for a return to production on higher grade ore.

The Silvermines Lead & Zinc Company Limited also suspended production in January 1958. Development was continued for some months before the mine was placed on care and maintenance. Diamond drilling of the Ballynoe barite deposit is still in progress. At the annual general meeting in November the chairman informed the shareholders that Cyprus Mines Corporation and Cerro de Pasco Corporation wished to put forward amended proposals for the exploration and development of the Silvermines.

Lead production at 525 tons of 70 percent Pb concentrate and zinc production at 750 tons of 55 percent Zn concentrate showed a large decrease from the 1957 figure.

The Gypsum Industries Limited at Kingscourt, County Cavan, maintained production although the tonnage produced, approximately, 103,800 tons showed a slight decline. The production of crude barite was approximately 10,000 tons which showed a slight increase from the 1957 figure.

Finland

A study of the Finnish mineral production figures shows that 1958 production in nearly all cases surpassed that for 1957, and in some cases all time high outputs were achieved.

Actually 1958 was a year of great activity, especially in exploration and mine development. A number of important discoveries of unknown ore bodies were made. Several new mines were under development.

Outokumpu Company closed its Aijala copper mine during 1958. At the same time, development work was continued at Leppävirta where operations will start in 1959. Production at this copper-nickel property is planned at the rate of 300,000 tons of ore per year. Outokumpu is also opening a lead mine at Korsnäs in western Finland where the scale of operations is planned at 100,000 tons of ore annually. Furthermore, the discovery of an extensive sulphide ore body carrying chalcopryrite, sphalerite, and pyrite was announced by the company late in 1958. This ore body is located in Pyhäjärvi in central Finland.

Otanmäki Company continued its operations at Otanmäki producing magnetite and ilmenite concentrates. The new vanadium plant reached its full capacity during 1958 and is now capable of treating all magnetite concentrate produced for the extraction of its vanadium which is separated by hydrometallurgical methods and obtained in a very high degree of purity. Otanmäki started the development of a magnetite ore body at Kärvävaara in northern Finland where production will start in 1959. Furthermore, the discovery of an unknown iron ore body at nearby Misiraaka was announced.

Vuoksenniska Company continued the development work at its two undersea magnetite ore bodies, one at Nyhamn in the Aland Islands, the other at Jussarö near the southern shore of Finland. In both cases, the main ore bodies were reached during 1958.

Several separate iron ore bodies have been located by Suomen Malmi Oy in Kolari in northern Finland opposite the well known Swedish iron ore center.

Mine Production in Terms of Ores Milled, Minerals, and Metals Recovered by Finnish Mining Companies in Metric Tons for 1956, 1957, and 1958

Commodity	1956	1957	1958
OUTOKUMPU COMPANY			
Ore milled	1,221,395	1,387,668	1,431,555
Copper conc. ^{1,2}	100,409	122,239	138,725
Pyrite conc.	288,684	292,340	250,072
Zinc conc.	75,066	80,859	85,630
Lead conc.	2,650	4,489	3,970
Tungsten conc.	59	—	318
OTANMAKI COMPANY			
Ore mined ³	742,399	802,244	830,042
Ore milled ³	595,009	628,702	639,379
Magnetite conc.	206,168	209,783	214,970
Ilmenite conc.	102,915	105,749	106,489
Pyrite conc.	5,401	4,814	4,473
VsOs (100%)	68.6	469.1	696.7
VUOKSENNISKA COMPANY			
Ore milled	120,029	108,225	107,000
Gold ⁴	197	202	200
Copper conc.	1,576	1,915	1,440

1. Average Cu content for 1957 was 21.1 percent.
2. Average Cu content for 1958 was 20.5 percent.
3. Difference between ore mined and milled is the lump waste separated in magnetic cobbling plant.
4. Kilograms.

Large scale diamond drilling was continued during 1958. No decision of the beginning of the mining operations has been reached so far.

Ruskealan Marmorio Oy intensified its exploration and development work at Luikonlahti where one or several copper ore bodies were discovered many years ago.

In the near future the mining industry in Finland seems to face a substantial increase in volume.

Federal Republic of Germany

Mine production of lead and zinc decreased in 1958 to the level of 1953 owing to the closing of high-cost mines. The production of pyrites was lower due to increased competition from native and by-product sulphur.

Iron ore output declined too in conformity with the development in iron and steel production, while the production of potash salts and rock salt (sodium chloride) increased.

Smelter production of aluminum, lead, zinc, and tin decreased, but the output of refined copper was higher than in 1957.

Smelter Production in Western Germany in Metric Tons in 1956, 1957, and 1958

Commodity	1956	1957	1958 ¹
Aluminum	147,362	153,838	136,766
Lead ²	161,005	177,341	173,404
Copper (refined)	253,525	253,389	268,249
Zinc (excluding dust)	190,630	185,407	179,258
Tin (unallayed)	1,727	2,081	1,827
Tin alloys	4,178	3,100	2,770
Solder	10,173	10,279	11,791
Pig iron	17,577,000	18,358,000	16,659,000
Steel ingots and castings	23,189,000	24,507,000	22,700,000

1. Estimated.
2. Including lead produced by battery manufacturers.

Mine Production of Metals and Minerals in Metric Tons in Western Germany in 1956, 1957 and 1958

Commodity	1956	1957	1958 ¹
Lead ore ²	66,300	72,000	61,900
Zinc ore ^{2,3}	121,800	126,400	117,300
Copper ore ⁴	1,700	1,800	1,700
Pyrites	646,900	612,300	570,000
Iron ore ⁵	16,928,000	18,320,000	17,984,000
Iron ore ⁶	4,512,000	4,826,000	4,745,000
Potash salts ⁷	15,544,000	16,200,000	16,664,000
Potash salts ⁷	1,965,400	1,986,000	2,017,000
Salt	3,581,000	3,587,000	3,573,000
Bauxite	4,894	4,736	3,839
Graphite	11,620	11,369	(4)
Fluorspar	146,358	135,433	(4)
Barytes	407,214	428,662	(4)
Feldspar	166,815	169,962	(4)
Soap-stone	18,143	15,659	(4)
China clay	350,696	363,139	(4)
Fuller's Earth	244,359	244,209	(4)
Mica	2,133	22	(4)

1. Preliminary figures. 2. Recoverable metal content. 3. Including recoverable zinc content of pyrites. 4. Not available. 5. Crude weight. 6. Iron content. 7. K₂O content.

German

Democratic Republic

Official figures for German Democratic Republic mining and metallurgical production covering the years to 1957 were released as shown in table.

Production of Metals and Minerals in East Germany in Metric Tons for 1954, 1955, 1956, and 1957

Commodity	1954	1955	1956	1957
Iron ore ¹	1,470,000	1,664,000	1,757,000	1,478,000
Copper ore ¹	1,302,000	1,333,000	1,350,000	1,393,000
Potash salts ²	1,463,000	1,552,000	1,556,000	1,604,000
Pyrites ³	47,000	49,000	54,000	54,000
Pig iron	1,318,000	1,517,000	1,574,000	1,663,000
Steel	2,331,000	2,508,000	2,740,000	2,895,000
Sulfur ⁴	88,366	95,493	94,236	101,798
Alumina ⁵	41,118	46,239	54,988	49,658

1. Crude. 2. K₂O equivalent. 3. Sulphur content. 4. Including byproduct production. 5. Calcined.

France

France was one of the few countries which showed a notable increase in production of minerals and metals in 1958. The mining and metallurgical industries operated at a high level during the year. Only major metal to show a decrease was lead production which was well in keeping with the rest of the world. France's lead production (smelter) dropped from 73,800 metric tons in 1957 to 70,600 tons in 1958. Zinc production, however, increased from 130,500 metric tons in 1957 to 149,900 in 1958.

Societe Miniere et Metallurgique de Penarroya announced early in the year that it planned to continue its lead-zinc development program despite the unfavorable world market. The firm invests about 400,000,000 francs a year in expanding production capacity and locating ore reserves. Its reserves are now estimated at nearly 48,000,000 tons of ore. Lead and zinc production from the Malines mine was doubled, and development of deposits at Saint Sebastien d'Agrefeuille, with proven reserves of 3,000,000 tons of lead ores, was started. The firm has properties all over the world. Iron ore production increased from

57,785,000 metric tons in 1957 to 59,455,000 metric tons in 1958. A new iron mine, the first in 25 years, was opened at Saize-rai, near Nancy, by Pont-a-Mousson and Pompey. The deposit was discovered before World War I but was considered unusable because of its high sulphur content. Now, a new technique developed by the French Steel Institute makes desulphurization possible. Output is expected to reach 2,000,000 tons annually when the mine reaches full production.

Other important mineral and metal increases during 1958 are as follows: bauxite, from 1,689,000 metric tons in 1957 to 1,798,000 in 1958; alumina, from 448,000 to 524,000; aluminum, from 160,000 to 169,000; magnesium, from 1,590 tons to 1,739; tungsten, from 838 tons to 907 tons; potash, from 1,576,600 metric tons to 1,664,000; pyrite, from 323,600 to 375,700.

Italy

Mine production by volume was more or less at the same level in Italy in 1958 as in 1957; pyrite, copper, and lead output were increased slightly while iron and manganese decreased.

The pyrite production of the important mines—Niccioleta, Gavorrano, Boccheggiano—of the Maremma Group in Western Tuscany, of Montecatini Company, slightly increased during 1958. Large pyrite stocks, about 180,000 tons, were accumulated by these mines at the end of 1958.

In the Niccioleta mine the development work was deeper toward lower levels where two large pyrite lenses were discovered.

Montecatini is now sinking a new main hoisting shaft at this mine. In the Boccheggiano mine, ventilation plants were improved by a new fan. At the Gavorrano mine, exploration in the Rigoloccio area continued with favorable results. The Impero hoisting shaft was sunk to depth of 800 feet below sea level. Ventilation of all the mine was improved by a new shaft.

In the old Vallimperina mine, near Udine, where pyrite deposits were discovered during 1957 by Montecatini, underground workings were repaired and ore dressing plants rebuilt.

Lead and zinc output from the mines of Sardinia was larger than in 1957 even if the market situation was not always suitable. Two mines were temporarily closed, all the other mines were reorganizing with the aim of reducing production costs. In some mines (Montevocchio, Monteponi, Fontana, Raminosa) ore dressing plants were rebuilt and enlarged.

A new flotation section was installed at Monte Tas-us, and a hydro-gravimetric ore dressing plant built at the Su Isteri mine.

In the Milano district the Zuc di Valbona mine where exploration started with good forecasts in 1957 remained unproductive, because of the problem of haulage. Exploration in the Salafossa district (near Belluno) yielded some interesting results.

Mercury production remained at the 1957 level. The Monte Amiata Company continued its major exploration program in the Monte Amiata district in which Italy's largest mercury deposits are located. Geological mapping, and gravimetric, electric, and seismic geophysical programs were underway. In 1958 a drilling program

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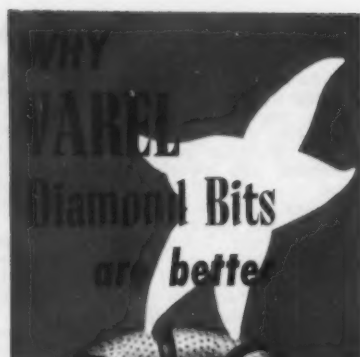
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Europe

Italian Metal and Mineral Production in Metric Tons in 1951, 1952, 1953, 1954, 1956, 1957, and 1958

Commodity	1951	1952	1953	1954	1956	1957	1958
Bauxite	174,014	282,912	248,947	295,082	259,712	261,111	283,000
Antimony ore	2,537	4,478	1,973	1,537	1,537	677	655
Iron ore	552,855	790,237	991,294	1,065,183	1,594,769	1,565,117	1,285,000
Manganese ore	52,721	81,190	78,384	76,310	46,015	47,002	44,400
Mercury ore	—	—	197,498	232,055	343,588	364,717	312,000
Lead conc.	64,375	64,665	66,219	69,125	81,825	87,046	95,000
Zinc conc.	212,822	234,411	223,928	240,686	247,617	265,525	320,000
Copper conc.	—	—	1,046	4,166	2,118	1,849	3,740
Asbestos fiber	22,612	23,941	20,281	23,546	30,753	34,287	35,800
Barite	76,541	56,274	71,762	71,898	92,334	99,290	94,500
Fluorspar	41,019	59,125	75,790	77,148	124,208	144,165	N.A.
Pyrite	898,186	1,141,417	1,234,566	1,231,700	1,308,591	1,469,577	1,534,000
Sulphur	214,340	236,439	223,061	204,040	195,208	194,340	186,000
Talc	75,996	80,336	80,282	—	92,852	91,766	108,000
Aluminum metal	49,751	52,830	55,463	57,572	63,409	66,500	64,000
Lead metal	36,000	34,931	37,944	37,331	39,116	39,400	47,000
Zinc metal	47,409	54,851	60,068	66,800	73,560	74,400	71,500
Mercury	53,800 ¹	57,740 ¹	51,330 ¹	54,430 ¹	2,135	2,200	2,120

1. Flasks. N.A. Not available.

using truck mounted rotary surface drills was started. Underground diamond drilling was carried out at the company's Abbadia S. Salvatore mine.

The Vallalta Company carried on underground mercury exploration in the Gosaldo area, near Belluno, without positive results.

Only by government aid was Sicilian sulphur production maintained at previous rate. Government exploration and drilling was carried on in search for unknown deposits. An experimental Roma furnace was installed and tested at the Gibellin sulphur mine near Agrigento. Development of a recently discovered 100,000 ton sulphur mass in the Comerio mine (Calabria) continued.

The decreased demand by Italian and foreign steel plants caused a reduction in iron ore production. Milano district's Gafione mine of Ferromin was closed, and the Manina mine, owned by the same company, reduced output. Also the Il Passo iron-manganese mine, Tuscany, was closed during 1958.

Exploration for iron minerals gave promising results in the Dongo (Como) e Pian della Preda Rossa (Tuscany) areas, the latter prospecting was by magnetic geophysical methods. Also, the exploration in Crecchia (near Palermo, Sicily) was interesting.

At the bauxite mine of San Giovanni Rotondo, near Foggia of Montecatini, a new two-cage hoisting shaft was sunk. At the bottom of this shaft, all underground haulage will be centralized. In the area around this mine, drill-holes discovered bauxite pockets.

Most of the intensive exploration for uranium was not successful. In Aspromonte and Sila, all the results were negative, and in the Vicenza and Belluno areas all the exploration permits were renounced. Only in the Val Daone area exploration within the "Gardena soudstones" continued. Some uranium mineralization was discovered in the porphyritic formations near Varese, but it was not confirmed as a commercial horizon.

Norway

The total production volume in Norway decreased somewhat in 1958, while the production value dropped sharply on account of lower prices for most products. The European economists predict a turn to the better in 1959, but most buyers prefer sitting on the fence for a while, and the mines and smelters prepare for another lean year.

The iron ore mines had record production in 1958, and the economic results were

good owing to favorable contracts dating back to 1957, but they face a substantial price cut for 1959.

The sulphide mines were affected the most; nearly all decreased production in 1958. The lone exception, Bleikvassli, started its new plant in operation late 1957, and the gain in lead, zinc, and pyrite concentrate output from this source partly offset the general decrease. The mines with copper concentrate as a main product are expecting a better year in 1959 while the pyrite producers are hit by a further decrease in prices and demand.

Coal production from the "Store Norske" mines at the Spitzbergen islands was cut sharply in 1958, and further decreases are expected. A large part of the production have been exported to Western Germany, but the new German tariffs will be prohibitive. The Kingsbay coal mines at Spitzbergen have been inactive some years to carry out an extensive modernization program. Production will start again in the summer of 1959.

No new mines or concentrating plants were opened during 1958, except the 10 tons per hour pilot plant for iron ore flotation at Rana. The 1,000,000 tons-a-year ilmenite ore project at Telnes is proceeding according to schedule.

On the exploration front, the main objects were the same as last year. At Kautokeino and Repparfjord in northern Norway large amounts of copper ore was proven in 1958, but no definite production plans have been announced. The deciding factor will of course be the long-range outlook for copper, and the fluctuations during the last years will probably not encourage investors.

The Lökken mines have discovered an extension to the main ore body at greater depth. The recently discovered Tverfjellet deposit which Follfald mine is investigating is proven to be of commercial size and grade.

The 300 year old Røros mine is embarking on a major exploration project over a large area. New discoveries are necessary to extend operations beyond the 10 years indicated by known ore reserves.

On the metallurgical front pig iron production is expected to increase further as two large electric furnaces recently were started at Rana and Bremanger. The rise in aluminum production is due to the new plant at Mosjøen which started up early in 1958. Both this plant and the plants at Årdal and Sunddal started expansions; in five years the total capacity in Norway will exceed 200,000 annual tons. Ferroalloy production is at present running far under capacity. Three of the plants put new furnaces in operation during 1958, and plans for a FeSi plant in Troms are seri-

Mine and Smelter Production in Metric Tons in Norway From 1955 Through 1958

Commodity	Average Grade	1955 ¹	1956 ¹	1957 ¹	1958 ¹
MINE PRODUCTION					
Iron ²	64.5% Fe	1,256,000	1,550,000	1,548,000	1,570,000
Ilmenite ⁴	44% TiO ₂	158,000	191,000	210,000	212,000
Pyrite ⁴		844,000	853,000	844,000	810,000
Copper ⁴	21% Cu	26,700	27,800	30,000	31,000
Zinc ⁴	49% Zn	14,000	12,200	14,100	16,000
Lead ⁴	66% Pb	1,100	1,300	1,400	3,700
Molybdenum ⁴	90% MoS ₂	300	290	320	290
Columbium ⁴	50% Cb ₂ O ₅	320	260	240	250
Graphite ⁴		5,400	5,000	5,700	4,500
Coal		322,000	390,000	384,000	300,000
SMELTER PRODUCTION					
Pig iron		123,000	191,000	243,000	265,000
Ferrosilicon	45 Si	108,000	108,000	151,000	120,000
Other ferroalloys		124,000	153,000	169,000	130,000
Aluminium		75,000	99,000	96,000	120,000
Magnesium		6,700	7,400	8,600	9,000
Copper		13,700	15,400	15,600	17,000
Copper matte	35 Cu	13,700	13,400	13,700	13,000
Nickel		18,500	19,400	21,100	24,000
Zinc		46,000	49,000	48,000	44,000
Sulphur		100,000	97,000	97,000	90,000

1. Official figures. 2. Estimated. 3. Ore and concentrates. 4. Concentrates.

ously discussed. The ferrocolumbium plant at Sovee is in steady operation.

The rise in copper and nickel production is entirely due to expansion at the Falconbridge electrolytic refinery at Kristiansand.

The metallurgical industry in Norway depends upon cheap hydroelectric power. Power has for many years been the limiting factor, but is expected soon to catch up with demand in the main sectors. This situation will certainly give new impetus to expansion plans for the electrometallurgical industry in Norway.

Portugal

Mining in Portugal in 1958 reached the lowest point in 10 years. Many mineral products were lower pricewise but the government and industry cooperated to hold production of most minerals almost at the 1957 level.

Iron, beryl, and chalcopirite mines continued operations. The tin mines were hard hit by price drops, but the greatest difficulty was experienced by the tungsten mines which are normally the most numerous and important in the country.

To protect the tungsten industry the government paid a subsidy, taking into account the 1957 output, and limiting payments to a previously fixed period.

Kaolin production has increased in recent years as the European market expands. Also kaolin reserves have increased at Custodias-Matosinhos and at Vila Fria-Viano do Castelo.

The most favorable developments were the start of electric steel production, 100

Production of Metals and Minerals in Metric Tons in Portugal in 1957 and 1958

Commodity	1957	1958
Arsenopyrite	7,941	6,338
Beryl	173	30
Sphalerite	303	0
Cassiterite ¹	1,762	1,785
Columbite-tantalite	32	11
Galena ²	2,246	1,446
Hematite	188,470	135,153
Kaolin	48,012	59,225
Magnetite	97,912	96,979
Manganese ore ⁴	5,475	4,988
Pyrite	668,768	598,165
Scheelite ⁴	256	34
Wolframite ⁴	3,727	1,653

1. 65 percent Sn. 2. 65 percent Pb. 3. 42 percent Mn.

tons per day, at Marao, the fine drilling results by the official prospecting department of the Anadia manganese beds; and the start of a new program at the Monte-sinho tin mines. Another development was the production of salt from the Cucos salt dome and transportation of brine to the industrial installations at Povoia de Santa Iria, 30 kilometers north of Lisbon.

Sweden

Iron ore production, exports, and prices were lower in 1958 than in 1957. Output was 18,600,000 tons; 20,035,000 in 1957. Export was not more than 14,810,000 tons; 17,467,000 in 1958.

In spite of the comparatively low production, the long expansion programs were going on as planned with opening of new levels and building of new concentration plants. Iron ore mines with high silica were storing their production at the end of the year. The metal mining companies such as Bolidens Gruvaktiebolag changed development plans depending on the prices of copper, lead and zinc. They stopped some shaft sinking of new mines such as Lövstrand. Some other prospected ores, as Keträsk, are waiting for better prices to be mined.

S.G.U.—The Geological Prospecting Department of Sweden—was prospecting for iron and base metal ore in Norrland. They found iron ore in Svappavaara, sulphide ore (copper and pyrite) in the northern part of Jämtland (4,500,000 tons in Stekanjokk consisting of 1.5 percent Cu, 3.4 percent Zn and 19 percent S), and 500,000 tons of Levin ore with the same content of copper, zinc and sulphur. In Brännmyran near Adak 200,000 tons with 1 percent Cu was discovered.

Private companies as well as the state prospected and found some uranium ore, i.e., in Norrland close to Kiruna. The uranium prospecting has not found any rich ore bodies, but several appear worth developing.

Production of high grade iron ore at Kiruna (LKAB) was about 10,000,000 tons; one-half from the open pit and one-half from sub level caving on 230 and 275 meter levels. Development of the 320, 370, and 420 meter levels was continued.

Three shafts were completed at the Central Plant so five ore and one man shaft were operating. About 3,000,000 tons of ore was hoisted and milled. Start

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Production and Export of Swedish Mineral Products in Metric Tons for 1954, 1955, 1956, 1957, and 1958

Commodity	1954		1955		1956		1957		1958	
	Production	Export	Production	Export	Production	Export	Production	Export	Production	Export
Iron ore	15,416,000	14,083,000	17,450,000	15,654,000	19,075,000	17,290,000	20,035,000	17,467,000	18,600,000	17,810,000
Pyrite	398,235	10,448	391,561	15,781	489,119	55,328	498,853	101,138	333,553	68,768
Lead conc.	40,372	10,110	43,870	12,982	46,085	15,332	50,722	18,006	58,751	12,624
Zinc conc.	103,335	110,356	104,557	105,074	117,166	127,746	118,720	138,007	122,832	138,315
Copper conc.	53,476	—	67,163	—	69,232	—	76,996	—	76,000	—
Tungsten conc. ¹	450	—	458	—	450	—	505	—	600	—
Fluorspar	—	—	—	—	1,000	—	2,600	—	2,891	—

1. 60 percent WO₃.

of the major underground system of bus tunnels was started in mid-year. By 1960 it will be possible for all workmen to be transported in buses from housing areas to underground stoping areas.

At Svärdsjö (Bolidens Gruvaktiebolag) —a sulphide ore mine with zinc, copper, lead, and silver—the shaft was sunk from the 150-meter level to 350 meters. The production was 30,000 tons, prospecting and development work are going on at levels of 250, 300, and 350 meters. The production will be 60,000 tons per year in 1961.

In Carpenberg (Bolidens Gruvaktiebolag) development work was done at the 300-meter level in order to get production of "dust" ore. The mining method is a modification of horizontal cut and fill.

Idkerberget (Stållbergsbolagen) built a new office and a house for the miners. While finishing block caving they have replaced the scrapers with the Atlas Copco T2G loader. The levels below the block caving are now developed for sub level caving, which was started in 1958.

The drift to the ore body on the 470-meter level at Bispsberg was finished. Ore from the 470 to 670 meter is mapped. There was, however, no production.

The development drift at Bastkärn was stopped by water. The production of lump ore was being stored at the end of the year. During 1959 a concentration plant will be built to produce and export concentrated iron ore. The production is around 40 tons per hour.

The rebuilding of milling and concentration plants at Håksberg (AB Statsgruvor) for a production of 240,000 tons per year was completed. Magnetic separation of magnetite and flotation of hematite is the flowsheet for this new plant.

Norbergs Gruvförvaltning continued driving an 18° inclined drift 1150 meter long for conveyor belt transport of ore from the 350 meter level to the sorting plant which was almost completed during 1958. Production will be 250,000 tons of lump ore and 200,000 tons of concentrated ore. The drifts of the other ore bodies, at the 250 and 300 meter levels, 2,500 meters long, were almost finished. During 1959 the concentration plant will be built and flotation of hematite is under development.

A new shaft, hoists, and a concentration plant for a production of 300,000 tons iron ore per year were in running order in the middle of the year at Bergslagskraft (Stora Kopparbergs Bergslags AB).

In August the mine head frame at Vassbo (Bolidens Gruvaktiebolag) was grouted with cement. The frame is 70 meters high. The main shaft was diamond drilled using eight holes 52 meters deep, at which level the lead ore is mined. The crusher will be installed at the 80 meter level. Not before the beginning of 1960 will the production of ore commence in Vassbo.

Larsvall (Bolidens Gruvaktiebolag) had a production of 640,000 tons of ore in

1958. Ore bodies were prospected and the known reserve is about 26,000,000 tons. During the year, a railway tunnel under Lake Laisan was completed.

In Malmberget (LKAB) two head frames for new shafts were completed and a new concentration plant as well as new workshops were under construction. Tunneling with Atlas Copco BUX 13 drill jib in combination with Joy drillmobil was going on. A new method for driving a raise with an Alimak hoist was introduced.

In Kristineberg (Bolidens Gruvaktiebolag) the old crushing plant with a capacity of 170 tons per hour was replaced by a new plant with a capacity of 500 tons per hour. In this new plant, two crushers (7-foot Symons) and two screens were installed during the spring of 1958.

In Malmberget at the 300-meter level where all horizontal ore transport is going on, a new centralized railway control station was installed. From this station they always know where the different trains are located. The different switches are also handled from this point. There is one train every 4th minute.

In the Grängesbergsbolagen's new mine, Strossa, shaft sinking and construction of buildings were speeded during 1958. The head frame, administration building, sorting and crushing plants etc. were being completed, but their machines were not totally installed. The mining method, sub level stoping with long hole drilling, was developed. The skip and all plants are built for a production of 1,150,-

000 tons per year with an overall content of 31 to 32 percent iron and 0.015 percent phosphorus. The final production will be 280,000 tons concentrated ore with 65 percent iron and 150,000 tons with a content of 70 percent iron for pelletizing. For each ton of concentrated ore 2.56 tons of rock will be hoisted.

Shipping outlook for high silica lump ore in 1959 is not good as European demand for this type ore is down. Therefore new concentration plants will be built. Prospecting and development will continue at a rapid pace.

Yugoslavia

In Yugoslavia 1958 was a year of full capacity production. Lead, zinc, aluminium and silver production were the highest on record; the output of other metals remained as high as in 1957.

Lead and zinc ore production remained on the level of previous years, but lead output increased 7 percent. The Trepcja smelters produced 70,665 tons of refined lead (65,221 in 1957) from their own ore and from the Kopaonik, Ajvalija, Zletovo, Kišnica, Blagodat, Suplja Stena, Veliki Majdan, Novo Brdo Mines; Srebrenica prospects, Rudnik and Lece. Besides lead the Trepcja smelters produced 111 tons silver, 77 tons bismuth and a small amount of gold. The new Kišnica mine, south of Trepcja, started production in the autumn. The ore contains 6 percent Pb and is milled

Metric Tons of Ore Mined in Yugoslavia in 1939, 1951, 1952, 1953, 1954, 1955, 1956, 1957, and 1958

Ore	1939	1951	1952	1953	1954	1955	1956	1957	1958
Lead-zinc	774,772	1,118,590	1,203,764	1,432,100	1,484,522	1,650,178	1,726,461	1,763,957	1,796,000
Copper	983,902	1,173,199	1,264,998	1,343,563	1,298,860	1,476,863	1,740,855	1,953,134	2,267,900
Antimony	18,963	35,088	74,594	61,450	75,258	80,474	83,056	85,547	75,524
Bauxite	718,594	453,357	577,196	462,309	680,597	791,057	881,418	888,240	733,000
Chromite	44,852	99,639	107,222	126,961	124,480	126,207	118,762	120,266	113,569
Manganese	5,556	12,868	N.A.	N.A.	N.A.	10,955	11,573	10,234	10,036
Pyrite conc.	78,064	113,541	N.A.	N.A.	N.A.	226,682	255,947	312,600	351,000

N.A. Not available.

Metric Tons of Metal and Alumina Produced in Yugoslavia in 1939, 1951, 1952, 1953, 1954, 1955, 1956, 1957, and 1958

Metal	1939	1951	1952	1953	1954	1955	1956	1957	1958
Refined Lead	10,651	60,068	67,180	70,796	66,729	75,612	75,759	78,504	84,281
Zinc	4,918	13,223	14,463	14,549	13,644	13,767	14,003	29,459	31,248
Blister copper	41,043	32,011	32,819	31,190	30,295	28,260	29,384	33,735	33,672
Electrolytic copper	12,463	14,004	21,390	27,764	26,946	24,837	25,008	30,128	29,950
Antimony	1,500	1,229	1,329	1,410	1,552	1,605	1,663	1,769	1,665
Mercury	378	505	504	492	498	503	456	425	423
Aluminium	1,795	2,828	2,563	2,792	3,496	11,499	14,682	18,134	21,681
Bismuth	—	88	99	98	110	104	111	100	77
Silver	1	94	80	95	88	93	86	81	117
Alumina	7,141	9,000*	NA	NA	NA	NA	48,206	50,236	54,000

* Approximate.

Metric Tons of Iron Ore Mined, Pig Iron and Steel Produced in Yugoslavia in 1939, 1951, 1952, 1953, 1954, 1955, 1956, 1957, and 1958

Commodity	1939	1951	1952	1953	1954	1955	1956	1957	1958
Iron ore	666,813	581,352	676,010	794,917	1,110,743	1,398,298	1,724,967	1,876,116	1,997,000
Pig iron	101,000	248,000	272,884	269,748	356,000	513,797	630,574	714,271	748,000
Steel	235,000	434,000	442,354	514,537	616,298	806,023	886,730	1,049,286	1,119,000

at Trepča. Srebrenica (Bosnia) is being prepared for production, a shaft is sunk, and the flotation plant is under construction. The Kaporčič prospect at Kopaonik has opened up large quantities of low grade ore. Zletovo (Macedonia) constantly increased ore output, a new mine is being opened up at Sase, nearby.

The Mešica lead smelters (Slovenia) produced 13,616 tons of refined lead (13,283 in 1957) from its own concentrates. Up-draught sintering gave very satisfactory results. The new Short-Drum furnaces started to smelt rich lead concentrates replacing the Newman hearths. Results of the tests have been encouraging. The old mine near Litija has been reopened and produced barite and 650 tons of lead concentrates.

The production of zinc increased 6 per cent compared with 1957. The smelters at Celje (Slovenia) produced 17,656 tons (16,481 in 1957). The electrolytic-zinc plant at Sabac (Serbia) produced 13,592 tons. The production of electrolytic cadmium at Sabac was about 30 tons. The Sabac plants are going to be enlarged considerably.

Copper ore output of the Bor mines (Serbia) increased 16 percent, but copper production remained on the 1957 level. Besides copper, 7 tons of silver were produced at Bor and some gold and selenium. The reconstruction of the copper smelters at Bor in connection with the opening of the Majdanpek mines was well under way. The normal gauge railway to Bor is nearly finished, the sulphuric acid plant, the bedding-building, the building for the reverberatory furnace and the converter building at Bor were half finished. Sulphuric acid from this new metallurgical complex will be used to produce superphosphate fertilizer at Prahovo on the Danube River. A \$23,000,000 United States credit is financing the fertilizer plant. All sections should operate in 1961. The Majdanpek mines, north of Bor, are now prepared for a production of 6000 ton ore per day, the open-work cover is taken off, foundations for the flotation plant are being built. Later the Majdanpek output will be doubled.

Iron ore output increased 7 percent, the Vareš mines (Bosnia) provided over 1,000,000 tons. Pig iron and steel production increased 6 percent. The Damjan

magnetite prospect (Macedonia) looks promising, production will start soon. This ore and the West Macedonian chamoisite ores will be treated in a new iron-steel plant at Skopje.

Antimony ore and metal production decreased slightly. At Stolice a new flotation plant was erected. The Bujanovac mine is exhausted. At the Lojane chromite mine (Macedonia) a big ore body containing 7 percent As and 6 percent Sb was being opened up and a flotation plant was under construction. This ore also contains some nickel.

Mercury production remained on the level of 1957. The order for a large kiln, placed in the Soviet Union over three years ago, has not been delivered. Idria is thus suffering a big loss of metal production year by year.

Bauxite output decreased as there was less export demand. Several deposits of good ore have been found in Bosnia and Montenegro. Alumina production was more than 54,000 tons. Kidričevo (Slovenia) provided 80 percent; the rest came from Moste-Ljubljana and Lozovac.

Aluminium production increased 20 percent. Kidričevo supplied 17,038 tons (14,961 in 1957); the rest came from Lozovac and Ražine (Dalmatia). The Kidričevo alumina plant was being reconstructed by Pěchiny, introducing a continuous Bayer process. Alumina and aluminium production will be doubled. In August 1958 the new factory for anodic paste at Kidričevo started operation. The plant has a capacity of 20,000 tons carbon paste per year.

United Kingdom

There was an expansion in production of China clay and iron ore in the United Kingdom in 1958, but the slump in base metal prices forced a number of lead mines to close or temporarily abandon operations.

English Clays, the major producing firm, reached an all-time high in production and increased profits. Exports declined. Final 1958 output has not been announced but 1957 production was 1,224,800 tons, and 1,196,000 in 1956. To meet the increasing demand for molo-

chite, a calcined aluminum silicate made from clay, a large new plant was brought into production in the fall. Other producers, such as Goonvean and Rostowrack Clay Company, also redesigned their treatment plants and are using hydraulic cyclones with considerable success.

Expansion of iron ore production continued throughout the year, although there was a slight recession in the steel industry. Production figures are not available at this writing. The mining section of the United Steel Companies was developing a new underground iron mine near Grantham to be known as Easton mine. Site preparation started. This is the first to be developed by this firm in the Northamptonshire-sands ironstone beds.

Mining operations at Halkyn United Mines in North Wales also became unprofitable and operations were suspended in April, although production of high-grade chemical and agricultural limestone from underground operations continued. The firm hopes to reopen when prices improve.

Operations at the Parc mine at Llanwrst, also in North Wales, also were curtailed. The overall effect of the market slump was to reduce the country's output from some 6,983 tons in 1957 to an annual rate at the end of the year of only 2,500 tons. Similarly, the production of zinc dropped from 968 tons to almost nil in 1958.

The Weardale Lead Mining Company, operating in County Durham, was in a little better position because the company produces both acid grade and metallurgical fluorspar, as well as lead, and the price of the former continued fairly steady. In this once extremely busy mining area, other properties producing fluorspar include The Anglo-Austral Mining Company's plant at Nenthead, the West Blackdene mine of the Beckermert Mining Company, the Stanhopeburn mine operated by Fluorspar Ltd., the Blackdene mine of United Steel Companies, and some mines operated by Blanchland Fluor Mines Ltd. The remainder of the country's fluorspar production comes from Derbyshire where the two largest producers are the Glebe mine at Eyam and



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the Masson mine near Matlock.

In Cornwall, the two major tin producers continue to maintain satisfactory production. In addition, the enlarged plant of Hydraulic Tin Ltd. at Bissoe produced more concentrate. At South Crofty mine, output was increased at the redesigned mill. The total concentrate sold for 1958 amounted to 742 tons and should enable the company to improve on the loss of the previous year. During the year ended April 30, 1958, 70,633 tons of ore were milled to yield 725.50 tons of tin concentrate. In the mine, 9,678

feet were developed.

The heavy media separation plant at South Crofty has been working for some time, and the old stamp mill was replaced by a rod mill operating in closed circuit with a Sherwen screen. To finance further mine improvements, sinking of a shaft another 240 feet, and completion of the modernization of the treatment plant, a stock issue was made.

The other Cornwall tin mine, Geevor Tin Mines Ltd., showed a profit for its year ended in March 1958, although the profit was not as large as in the preced-

ing year. The profit reduction was due partly to the lower tin price, partly to an increase in expenses of around £9,500, and partly to the fact that the flotation residues which are rich in copper brought less money on the world market. During the year, 66,577 tons were mined. The average recovery was 23.98 pounds of tin concentrate per long ton milled. A record development footage of 9,194 feet on eight lodges was undertaken. Ore reserves stood at 190,533 tons at year's end. During the calendar year of 1958, 695 tons of tin concentrate were produced.

CANADA

Uranium in 1958 was for the first time the most valuable metal mined in Canada on a total value of production basis. The \$290,228,356 sales figure was far ahead of second place nickel at \$196,733,985. Nickel output was adversely affected by the three-month strike of Sudbury miners at International Nickel Company of Canada, Ltd. However, even if there had been no strike, nickel would have remained in second place because of increased uranium mining and milling at Blind River, Ontario. Three new companies and two new mills were commissioned by another producer.

Notable progress was made during the year to increase nickel producing facilities in Manitoba. At Thompson Lake, International Nickel continued mine development while building a new flotation mill, smelter, and towns. This will be the world's second largest production unit when completed. Sherritt Gordon Mines, Limited started plant expansion to increase production from 2,000 to 3,500 daily tons.

Iron ore developments in the Mount Reed-Mount Wright-Ungava districts came thick and fast during the year. The United States Steel Corporation's subsidiary, Quebec Cartier Mining Company, announced plans and let initial contracts for start of a \$300,000,000 project to eventually produce 8,000,000 annual tons of high-grade magnetite pellets. Open-pit mines will be developed, a concentrator and pelletizing plant erected, a 193-mile

railroad built, a hydroelectric power plant constructed, and two towns completed to bring low-grade magnetite deposits into production in Northern Quebec. Not far to the northeast, the Wabush Iron Company, Limited, the United States firm of Pickands, Mather & Co. operator, announced plans to build a railroad from its Wabush Lake deposits to the existing Iron Ore Company of Canada's main line railroad. Wabush Iron must also mill its ore before shipment. Canadian Javelin Limited leases the properties to Wabush Iron. First iron shipments were made by Canadian Charleson Limited from its new gravity concentrator near Steep Rock and by Hilton Mines in Quebec. Exploration for iron ore continued in most of eastern Canada at a rapid rate, much of it financed by major United States steel firms.

The first production of mined potash ore was made near year's end by the Potash Company of America, Ltd. from its new deep mine near Saskatoon, Saskatchewan. In the same district, near Esterhazy, International Minerals and Chemical Corporation of Canada continued mill construction and shaft sinking to bring its mine into production.

Exploration for copper and iron continued in Highland Valley, British Columbia. Craigmont Mines, Limited finished drilling its property near Merritt, announced a major discovery, and started underground exploration during the year.

First asbestos was produced by ASAR-

CO's subsidiary, Lake Asbestos Company of Quebec, Ltd., by Carey Canadian Mines Limited, and by National Asbestos Mines, Limited.

Major copper mine expansions were underway during the year in the Chibougamau district of northern Quebec with Opemiska Copper Mines Limited scheduled to increase mill capacity from 1,000 to 2,400 daily tons. A new mine and 1,500-ton mill are planned by Copper Rand Chibougamau Mines Limited in the same area.

Greatest exploration and drilling activity continued to center in the Bell River-Watson Lake district in northwestern Quebec. The late 1957 discovery of copper-zinc-silver-gold ore by Mattagami Syndicate started a rush to the area which resulted in major discoveries by New Hosco Mines Limited, Orchan Mines Limited, and Kennecott Explorations Canada, Ltd. (Kennecott Copper Corporation). By year's end, hundreds of claims had been staked by several 10's of mining companies in a 2,000-square-mile area. Drilling holds promise for additional discoveries.

Gold miners got a boost when the Emergency Gold Mining Assistance Act was passed to increase cost-aid by 25 percent and extended it to include 1960.

Canadian companies continue to expand from exploration to metal refining with the assurance that in the years ahead Canada will continue to be the largest producer and exporter of minerals.

Metal Production and Values in Canada as Tabulated by the Dominion Bureau of Statistics For 1956, 1957, and 1958

Metal	Quantity	1956	Value	Quantity	1957	Value	Quantity	1958 ¹	Value
Antimony ²	1,820,000		\$ 576,300	1,360,731		\$ 370,442	925,000		\$ 292,153
Asbestos ⁴				1,046,086		104,489,431	942,135		96,168,029
Barite ⁴				228,048		2,992,913	201,329		2,067,916
Bismuth ²	273,007		494,157	319,941		584,917	457,088		861,185
Cadmium ²	2,258,184		3,838,913	2,368,130		4,025,821	1,841,425		2,798,965
Cobalt ²	3,685,956		9,372,670	3,922,649		7,784,423	2,521,240		5,196,088
Copper ²	706,585,547		291,469,615	718,218,535		206,897,988	698,929,034		178,077,588
Fluorspar ⁴				66,245		1,756,841			1,552,255
Gold ²	4,378,862		150,808,010	4,433,894		148,757,143	4,534,455		154,065,481
Indium ²	358,000		805,500	384,360		693,770	69,000		155,250
Iron Ore ²	22,526,311		156,327,885	22,272,174		167,221,425	15,878,481		121,437,285
Iron Ingots ⁴	157,000		6,339,000	187,529		10,083,434	118,000		6,342,500
Lead ²	373,349,551		57,906,514	362,968,529		50,670,407	371,540,693		42,095,560
Magnesium and Calcium ²			5,617,826	16,770,371		5,254,896	11,620,205		3,591,064
Molybdenum ²	1,452,028		967,461	783,739		1,166,557	566,600		781,231
Nickel ²	355,986,460		223,343,992	375,916,551		258,977,309	278,082,795		196,733,985
Palladium, Iridium, Rhodium, Ruthenium etc. ²	161,600		6,495,065	216,582		7,896,209	150,720		4,491,809
Platinum ²	150,000		15,585,000	199,565		17,835,124	144,565		9,277,140
Selenium ²	508,000		8,858,000	321,392		3,535,312	405,264		2,624,480
Silver ²	28,794,573		25,831,612	28,823,298		25,182,915	31,311,375		27,200,192
Tellurium ²	24,000		42,000	31,524		55,167	43,278		74,554
Tin ²	611,000		521,550	709,102		580,342	718,000		692,870
Titanium ²	4,443		37,100	10,770		97,075	5,415		36,100
Tungsten Concentrates (WO ₃) ²	2,206,662		6,060,992	1,921,483		5,279,275	690,977		1,900,187
Uranium ²			39,577,000	13,271,414		136,304,364	28,237,332		290,228,356
Zinc ²	847,239,825		125,476,218	827,481,656		100,042,533	857,275,945		93,100,167
Total Value			\$1,136,352,380			\$1,268,536,033			\$1,341,842,000

1. Preliminary estimate 2. Pound 3. Ounces 4. Tons

CARIBBEAN

Jamaica

Jamaica's bauxite mining industry during 1958 continued to expand and within the last few years the island has become the major bauxite producer of the free world. The exports of kiln-dried bauxite for the year amounted to 5,589,718 long tons as compared with 4,239,972 long tons in 1957. This amount of ore exported by the two United States companies, Reynolds Jamaica Mines Ltd., and Kaiser Bauxite Company, contained an average of 14.1 percent moisture so that the corresponding figure for the moisture-free ore exported equals 5,798,750 long tons. In addition to these exports 922,953 long tons of bauxite were mined by Alumina Jamaica Ltd. for the local manufacture of alumina in its Kirkvine Works and 373,107.7 long tons of alumina exported during the year. Thus, the total annual bauxite output of the island was well over 6,500,000 tons.

All three operating bauxite companies, in addition to their mining operations, have been engaged in further prospecting and exploration on the lands which they have acquired or on which they have options to purchase. The construction of the new £12,000,000 alumina plant near Ewarton by Alumina Jamaica Ltd. was slowed down and at the end of the year the plant although near completion was not yet in operation. Two other companies, viz, Caribex Limited, a subsidiary of American Metal Climax Inc., and Harvey Aluminium Inc., continued their prospecting operations for additional bauxite resources in various parts of the island.

The other mineral commodity with a similar increase in production was gypsum. The total annual production of crushed gypsum rock amounted to 599,591 long tons, as against 189,161 long tons in 1957. Of this amount 587,759 tons were exported and 11,832 tons sold locally to the cement producers and others. The high export figure which is three times that of the previous year is attributed to the strike-bound conditions which existed in certain markets and which led to the greater demand for Jamaican gypsum. It is anticipated that 1959 production will return to normal and will be in the range of 250,000 tons.

The use of limestone rock as a building stone, road metal, etc., remained at approximately the same level as in the previous year. The Caribbean Cement Co., Ltd., used 116,054 tons of limestone, 35,197 tons of clay and 9,687 tons of gypsum for the manufacture of Portland cement. The cement output for 1958 was 175,397 tons.

A good deal of prospecting and exploration work for iron, copper and other metalliferous ores was carried out by various mining companies and individuals. This work is partly still in progress and although it has not yet resulted in actual mining operations prospects exist in certain areas for profitable minor mining schemes. Apart from high-grade copper veins of small extent larger bodies of low-grade copper mineralization in andesitic porphyries, etc., have been encountered. Mavis Bank Iron Ore Ltd. continued its program of prospecting for iron on the Mining Lease at Mavis Bank, and about 1,000 feet of exploratory diamond drilling was done and access roads established.

Cuba

Cuba's largest post-war mining development is still the \$75,000,000 investment of Freeport Nickel Company in a nickel-cobalt deposit at Moa Bay. (The company, a subsidiary of Freeport Sulphur Company, was first called Cuban American Nickel Company, but this name was changed late in 1958.) When in full production, its output, together with that of Nicaro Plant, will make Cuba the second largest source of nickel in the world. Cuba will also be the leading source of cobalt in the Western Hemisphere and second largest in the Free World.

During the year, development work ad-

vanced rapidly, despite some interference from rebel forces who kidnapped key executive and engineering personnel for a short time. Among the numerous contracts awarded was one to Girdler Construction Division of National Cylinder Gas Company to engineer and equip an automatic plant which will produce 60 tons of liquid hydrogen sulfide daily for the ore concentrating facilities. It is said to be the first large-scale hydrogen sulfide plant ever used in ore processing.

Nickel Processing Corporation, operating the Nicaro plant for the U.S. government, continued its production of nickel during the year. Most of the stock of Nickel Processing is held by National Lead Company. During the year, North American Mining Corporation was formed

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Caribbean

by Bunker Hill Company, St. Joseph Lead Company, Falconbridge Nickel Company, and Blyth & Company, in order to bid on the Nicaro plant which the government announced plans for selling.

The Cuban government's Economic and Social Development Bank (BANDES) made quite a few loans during the year to stimulate industrial activity. Compania Aurifera Guaracabuya S.A. received a \$150,000 loan to develop the gold mining concession of San Roque, Caworo, Coralia, and Reconstruccion. Compania Operadora Rometals S.A. was authorized to borrow up to \$7,400,000 to install a sulfuric acid plant at the port town of Santa Lucia in Pinar del Rio Province. It was anticipated that a number of dormant iron pyrite mines in Pinar del Rio and other provinces of the island would be reactivated to supply the feed for the plant. Cia. Inspiracion Cubana de Cobre received a \$400,000 loan to expand copper producing facilities at the San Fernando mine, Las Villas Province.

Cia. Minera Buena Vista installed a new 350-ton-per-day concentrator at its copper mine near Cabanas. The plant was already running over capacity at 425 to 450 tons, and was being enlarged to treat 500 to 550 tons. The mine is open pit and known reserves are presently about 1,000,000 tons.

During the year, Cuban Independent Oil Company organized the Cuban Magnesite Corporation to calcine magnesite from a large ore bed. Compania Minera Yarayao purchased the Triumph Mining Company's 300-ton mill located at Triumph, Idaho and planned to ship it to Cuba for use at the firm's manganese property.

Haiti

Reynolds Haitian Mines, a subsidiary of Reynolds Metals Corporation, completed its first full year of operation at its bauxite property near Miragoane. The \$8,000,000 investment had taken two years to complete before production was started in mid-1957. During 1958, regular shipments were made to Reynolds' plants at Corpus Christi, Texas, but there was a company-wide reduction to bring production into line with a reduced demand for aluminum.

Most active Haitian mining operation was that of Consolidated Halliwell Ltd. (Canada) whose wholly owned subsidiary Sedren S.A. continued to explore and develop the several copper mineralization showings on its 100-square-mile concession area in the Terre Nueve district. Prospecting and reconnaissance geological mapping were confined to the western half of the concession. Underground development continued steadily at Meme with three adit levels being driven at 170-foot intervals. A three-compartment winze was being sunk to reach 300 feet below the lowest (No. 1 adit) level.

A complete camp was established at Meme, including living quarters, warehouse, temporary shops and power plant, assay lab, etc. The major portion of work on the excavation concentrator site, permanent power plant and shops had been completed. Access and service roads now total 12 miles in length. Construction of a wharf and pier at Gonaives Bay were started in November. Financing arrangements were completed and construction contracts awarded to bring the Meme ore body into full production at a rate of 1,500 tons per day by early 1960.



1959 ORE BUYERS' GUIDE

Possible Markets for: ORES, METALS, NON-METALLICS

As compiled from lists furnished by the Division of Minerals, U. S. Bureau of Mines, and ore and metal buyers

ANTIMONY

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Associated Metals & Minerals, 75 West St., New York 6, N. Y.
Derby & Co., Inc., 10 Cedar St., New York 5, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
W. R. Grace & Co., Hanover Square, New York 5, N. Y.
Harshaw Chemical Co., 1945 E. 97th Street, Cleveland 6, Ohio
Intercontinental Metal Corp., 607 Fifth Avenue, New York 17, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
McGean Chemical Co., 1040 Midland Building, Cleveland 15, Ohio
Metal & Thermit Corp., 100 E. 42nd Street, New York 17, N. Y.
Metal Traders, Inc., 67 Wall Street, New York 5, N. Y.
Metro Smelting Co., Ontario & Bath Sts., Philadelphia 34, Pa.
National Lead Co., 111 Broadway, New York 6, N. Y.
Philipp Brothers, Inc., 70 Pine Street, New York 5, N. Y.
South American Mineral & Merchandising Corp., 445 Park Avenue, New York 22, N. Y.
Southern Lead Co., 2800 W. Moreland St., Dallas, Tex.
C. Tennant, Sons & Co., 100 Park Avenue, New York 17, N. Y.
Nathan Trotter & Co., 36 North Front Street, Philadelphia 4, Pa.
Wah Chang Corporation, Woolworth Building, New York 7, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

ASBESTOS

American Asbestos Textile Corp., Strawbridge & Sterigere Sts., Norristown, Pennsylvania
Carolina Asbestos Co., Davidson, North Carolina
Ehret Magnesia Mfg. Co., Valley Forge, Pennsylvania
Garlock Packing Co., 250 Main Street, Palmyra, New York
International Bartering Co., 52 Broadway, New York 4, N. Y.
Johns Manville Sales Corp., 22 E. 40 Street, New York 16, New York
Kearney & Mattison Co., Ambler, Pennsylvania
Pabco Products, Inc., 1550 Powell Street, Emeryville, California
The Philip Carey Mfg. Co., 1935 Easton Blvd., Lockland, Cincinnati 15, Ohio
Raybestos-Manhattan, Inc., Passaic, N. J.
The Ruberoid Co., South Bound Brook, New Jersey
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Union Asbestos & Rubber Co., 332 South Michigan Ave., Chicago 4, Illinois
U. S. Rubber Co., 1232 Ave. of the Americas, New York, New York
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

BARITE GRINDERS

(Possible Buyers of Crude Barite)

Acme Barite Co., Mineral Point, Mo.
Barium Products, Ltd., P. O. Box 920, Modesto, Calif.
Baroid Sales Division, National Lead Co., P. O. Box 1675, Houston 1, Texas
The Glidden Co., Chemical & Pigment Division 766 50th Ave., Oakland 1, Calif.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Industrial Minerals & Chemical Co., Sixth and Gilman Sts., Berkeley, Calif.
Macco Corp., 14409 S. Paramount Blvd., Paramount, Calif.
Magnet Cove Barium Corp., P. O. Box 6504, Houston 5, Texas
Mobar Corp., Mineral Point, Mo.
Ozark Smelting and Mining Co., Coffeyville, Mo.
Super Bar Co., Mineral Point, Mo.
C. K. Williams & Co., 2001 Lynch Ave., East St. Louis, Ill.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Possible buyers of Crushed or Ground Barite for Use in Glass)

Anchor-Hocking Glass Co., 109 N. Broad St., Lancaster, Ohio
Ball Bros., Ryan and Burt Sts., Muncie, Ind.
Brockway Glass Co., Brockway, Pa.
Buck Glass Co., Fort and Silas Sts., Baltimore, Md.
Commercial Glass Co., Fairmont, W. Va.
Diamond Glass Co., Royersford, Pa.
Foster-Forbes Glass Co., Marion, Ind.
Hazel-Atlas Glass Co., 1942 Danneburg St., Wheeling, W. Va.
Lathford-Marble Glass Co., P. O. Box 4707, Los Angeles, Calif.
Owens-Illinois Glass Co., Duraglas Bldg., Toledo, Ohio
Owens-Illinois Pacific Coast Co., 135 Stockton St., San Francisco, Calif.
Sterling Glass Co., Dapel, Ind.
Thatcher Manufacturing Co., Elmira, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Possible Buyers of Ground Barite for Use in Paint)

Amalgamated Paint Co., Inc., Pier 11, North River, New York, N. Y.
Armstrong Cork Co., 1010 Concord St., Lancaster, Pa.
Atlantic Paint & Varnish Works, Wilmington, N. C.
Baker Paint & Varnish Co., 224 Suydam Ave., Jersey City, N. J.
C. E. Butler Co., 2868 Hanna St., Oakland 8, Calif.
Fisher Thorsen & Co., Inc., 2100 N. W. 22nd Ave., Portland 10, Ore.
W. P. Fuller & Co., 301 Mission St., San Francisco, Calif.
General Paint Corp., 2627 Army St., San Francisco 19, Calif.
U. S. Gypsum Co., 300 W. Adams St., Chicago, Ill.
Wesco Waterpaints, Fifth and Grayson Sts., Berkeley 2, Calif.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Possible Buyers of Crude Barite for Use in Barium Chemicals)

Barium Products Ltd., P. O. Box 920, Modesto, Calif.
Barium Reduction Corp., Drawer 1, South Charleston, W. Va.
Chicago Copper & Chemical Co., Blue Island, Ill.
Mallinckrodt Chemical Works, 2nd & Mallinckrodt Streets, St. Louis 7, Mo.
Standard Ultramarine & Color Co., Box 2166, Huntington 18, West Va.

BENTONITE

(Possible Buyers of Crude and Ground)

Abbott Laboratories, North Chicago, Ill.
Americana Colloid Co., Merchandise Mart Plaza, Chicago 54, Ill.
Atlantic Refining Co., 269 S. Broad St., Philadelphia, Pa.
Baroid Sales Div., National Lead Co., P. O. Box 1675, Houston 1, Texas
Cities Service Refining Co., Boston, Mass.
Commercial Minerals Co., San Francisco, Calif.
Charles B. Crystal Co., Inc., 53 Park Place, New York, N. Y.
Eastern Clay Products, Inc., 223½ Main St., Jackson, Ohio
Filtrol Corp., 634 So. Spring St., Los Angeles 14, Calif.
Great Lakes Foundry Sand Co., 700 United Artists Bldg., Detroit, Mich.
Gulf Refining Co., 240 S. Broad St., Phila., Pa.
Hammil & Gillespie, Inc., 225 Broadway, New York 7, N. Y.
Harshaw Chemical Co., 47 Ann St., New York 7, N. Y.
Pure Oil Co., 35 E. Wacker Dr., Chicago, Ill.
Quaker State Oil Corp., Emmenton, Pa.
Richfield Oil Corp. of New York, Chanin Bldg., New York, N. Y.
United Clay Mines Corp., 109 Oakland St., Trenton, N. J.
Western Clay and Metals Co., 1 So. 2nd St., Alabama, Calif.
Western Clay Products Co., P. O. Box 231, Houston, Texas
Western Tale Co., 1901 E. Slauson Ave., Los Angeles 11, Calif.

BERYL

Beryllium Corp., P. O. Box 1462, Reading, Pa.
Beryl Ores Co., P. O. Box 409, Rouse 1, Arvada, Colo.
Brush Beryllium Co., 4301 Perkins Ave., Cleveland 3, Ohio
Champion Spark Plug Co., Toledo 1, Ohio
Derby and Co., Inc., 10 Cedar St., New York 5, N. Y.
Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
U. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Metallurg, Inc., 100 Park Ave., New York 17, N. Y.
Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
A. O. Smith Corp., 3533 N. 27th St., Milwaukee 16, Wisc.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.
Note: Domestic beryl is purchased at Government buying depots at Custer, S. Dak., Franklin, N. H., and Spruce Pine, N. C.

BISMUTH

(Metal)

American Metal Climax Inc., 61 Broadway, New York 6, N. Y.
American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
The Anaconda Co., 25 Broadway, New York 4, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
J. T. Baker Chemical Co., Phillipsburg, N. J.
Corro de Pasco Corp., 300 Park Ave., New York 22, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Mallinckrodt Chemical Works, 2nd & Mallinckrodt Streets, St. Louis 7, Mo.
Merck & Co. Inc., Rahway, N. J.
National Lead Co., 111 Broadway, New York 6, N. Y.
Norwich Pharmacal Co., 17 Eaton Avenue, Norwich, N. Y.
Charles Pfizer & Co., Inc., 11 Bartlett Street, Brooklyn 6, N. Y.
Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
U. S. Metals Refining Co., 61 Broadway, New York 6, N. Y.
U. S. Smelting Refining & Mining Co., 75 Federal St., Boston 6, Mass.

CADMIUM

American Metal Climax Inc., 61 Broadway, New York 6, N. Y.
American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
American Zinc, Lead and Smelting Co., 1600 Paul Brown Bldg., St. Louis, Mo.
The Anaconda Co., 25 Broadway, New York, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
The Bunker Hill Co., P. O. Box 29, Kellogg, Idaho
Chemical and Pigment Co. (Div. of the Glidden Co.), Baltimore 22, Maryland
Eagle Picher Co., (Mining and Smelting Div.), P. O. Box 910, Miami, Okla.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Minerals and Metals Corp., 11 Broadway, New York 4, N. Y.
International Smelting and Refining Co., 818 Kearns Bldg., Salt Lake City, Utah
New Jersey Zinc Co., 160 Front St., New York 38, N. Y.

Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
 Sherwin-Williams Co., Onark Smelting & Mining Div., 161 Prospect Av.,
 N.W., Cleveland 1, Ohio.
 C. Tennant, Sons & Co., 160 Park Ave., New York 17, N. Y.

CHROME ORE

(Metallurgical Ore Users)

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 Baltimore Works, Armco Steel Corp., 3400 E. Chase St., Baltimore 13, Md.
 Electro-Metallurgical Corp., 30 E. 42nd St., New York 17, N. Y.
 E. A. Godey & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R., Hanover Square, New York City, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Keokuk Electro-Metals Co., Keokuk, Iowa
 Montana Ferroalloys, Inc., P. O. Box 1400, Memphis, Tenn.
 Ohio Ferro-Alloys Corp., 539 39th St. N.W., Canton 9, Ohio
 Pacific Northwest Alloys, Inc., P. O. Box 6247, Hilliard Station, Spokane, Wash.
 Pittsburgh Metallurgical Co., Niagara Falls, N. Y.
 C. Tennant, Sons & Co., 160 Park Ave., New York 17, N. Y.
 Tennessee Products & Chemical Corp., 500 First American National Bank Bldg., Nashville 3, Tenn.
 Vanadium Corporation of America, 430 Lexington Ave., New York 17, N. Y.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Chemical Ore Users)

Columbia-Southern Chemical Corp., 992 Garfield Ave., Jersey City 5, N. J.
 Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio
 Diamond Alkali Co.-Kearny Plant, Belleville Turnpike, Kearny, N. J.
 Foote Mineral Co., Inc., 10 E. Chelten Ave., Philadelphia 44, Pa.
 E. A. Godey & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R., Hanover Square, New York City, N. Y.
 Imperial Paper & Color Corp., Glens Falls, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Mutual Chemical Div., Allied Chemical & Dye Corp., 99 Park Ave., New York 16, N. Y.
 Frank Samuel & Co., Inc., Lincoln-Liberty Bldg., Philadelphia 7, Pa.
 Solvay Process Div., Allied Chemical & Dye Corp., P.O. Box 271, Syracuse, N. Y.

(Refractory Ore Users)

Basic Refractories, Inc., 845 Hanna Bldg., Cleveland 15, Ohio
 General Refractories Co., 1520 Locust St., Philadelphia 2, Pa.
 E. A. Godey & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R., Hanover Square, New York City, N. Y.
 Harrison-Walker Refractories Co., 1800 Farmers Bank Bldg., Pittsburgh 23, Pa.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland 12, Calif.
 E. J. Lavine & Co., 3 Penn Center Plaza, Philadelphia 2, Pa.
 Frank Samuel & Co., Inc., Lincoln-Liberty Bldg., Philadelphia 7, Pa.
 U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

COBALT

Ceramic Color & Chemical Mfg. Co., New Brighton, Pa.
 Harshaw Chemical Co., 1945 East 97th St., Cleveland 8, Ohio.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Kennametal, Inc., Latrobe, Pa.
 Metallurgical Resources, Inc., Newburgh, N. Y.
 Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
 The Pyrites Co., Wilmington, Del.
 Shepherd Chemical Co., Highland Avenue, Cincinnati 12, Ohio.

COLUMBITE-TANTALITE

African Metals Corp., 25 Broad St., New York 4, N. Y.
 J. E. De Souza Co., Inc., 217 Broadway, New York 7, N. Y.
 Derby & Co., 10 Cedar St., New York 5, N. Y.
 Electro Metallurgical Division of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
 Fantsteel Metallurgical Corp., N. Chicago, Ill.
 Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
 Grace & Co., W. R., Hanover Square, New York City, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Kennametal, Inc., Latrobe, Pa.
 Mallinckrodt Chemical Works, 2nd & Mallinckrodt St., St. Louis 7, Mo.
 Metal Hydrides Inc., 12-24 Congress St., Beverly, Mass.
 Standard Ore & Alloys Corp., 120 Wall St., New York 5, N. Y.
 C. Tennant, Sons & Co., 160 Park Ave., New York 17, N. Y.
 Wah Chang Corp., Woolworth Bldg., New York 7, N. Y.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

COPPER

American Metal Climax Inc., Carteret, N. J.
 American Smelting & Refining Co., El Paso, Tex., Garfield, Utah, Hayden, Ariz., Tacoma, Wash.
 The Anaconda Co., Anaconda, Mont.
 E. A. Godey & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R., Hanover Square, New York City, N. Y.
 Inspiration Consolidated Copper Co., Inspiration, Ariz.
 International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
 International Smelting & Refining Co., Miami, Ariz.
 Magma Copper Co., Superior, Ariz.
 Phelps Dodge Refining Corp., Laurel Hill, N. Y.
 Phelps Dodge Corp., Douglas, Ariz., Morenci, Ariz., Ajo, Ariz.
 Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
 C. Tennant, Sons & Co., 160 Park Ave., New York 17, N. Y.
 Tennessee Copper Co., Copperhill, Tenn.

DIATOMITE

American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y.
 General Refractories Co., 1515 Locust St., Philadelphia, Pa.
 B. F. Goodrich Co., 440 S. Main St., Akron, Ohio
 Hygeia Filter Co., 3422 Denton St., Detroit, Michigan.
 Industrial Minerals & Chemical Co., 836-38 Gilman St., Berkeley, Calif.
 Marshall Dill Division, WhitCo Chemical Co., 30 Bluxome St., San Francisco, Calif.
 National Filter Media Co., Sales Div. of Filter Media Corp., 1719 Dixwell Ave., New Haven, Conn.

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American Smelting and
Refining Company,
Ore Purchasing Department,
120 Broadway,
New York 5, N. Y.

50-54

ASARCO

FELDSPAR

(Possible Buyers of Crude, Crushed, or Ground)

Akron Porcelain Co., Kenmore Station, Akron, Ohio
Ball Brothers Co., Muncie, Ind.
Corning Glass Works Co., 1943 Crystal St., Corning, N. Y.
Donnelly-Kelley Glass Co., 49 Fenlon St., Holland, Mich.
General Ceramics Co., 30 Rockefeller Plaza, New York, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
Hazel-Atlas Glass Co., 1942 Dannelberg St., Wheeling, W. Va.
Knox Porcelain Corp., 150 Mynders St., Knoxville, Tenn.
Knox-Illinois Glass Co., Toledo, Ohio
Owens-Pacific Coast Co., 15 H & Folstone St., San Francisco, Calif.
Porcelain Products Co., Inc., 1941 Broadway, Parkersburg, W. Va.
Star Porcelain Co., Muirhead & Dewey Aves., Trenton, N. J.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Trenton Pottery Co., Inc., Trenton, N. J.
Wellsville China Co., Wellsville, Ohio

FLUORSPAR

(Brokers or Selling Agents)

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Balfour, Guthrie & Co., Los Angeles, Calif.
Continental Ore Co., 500 Fifth Ave., New York City.
E. I. du Pont de Nemours & Co., 1007 Market St., Wilmington, Del.
Forte Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
E. A. Godey & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
Kerchner, Marshall & Co., Oliver Bldg., Pittsburgh, Pa.
E. J. Lavine & Co., 1528 Walnut St., Philadelphia, Pa.
Mercantile Import & Export Corp., 21 East 49th St., New York City.
Mercantile Metal & Ore Corp., 60 Wall St., New York City.
Oglehay Norton & Co., Hanna Bldg., Cleveland, O.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

GERMANIUM

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
American Zinc, Lead and Smelting Co., 815 Olive St., St. Louis, Mo.
Eagle Picher Co., Mining and Smelting Div., First Nat. Bank Bldg., Miami, Ohio.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
Sylvania Electric Products, Inc., Towanda, Pa.

GRAPHITE

The Asbury Graphite Mills, Inc., 41 Main St., Asbury, N. J.
Cummings-Moore Graphite Co., 1646 Green Ave., Detroit 9, Mich.
Joseph Dixon Crucible Co., 167 Wayne St., Jersey City 3, N. J.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
Charles Pettino, Inc., 1 E. 42nd St., New York 17, N. Y.
Superior Graphite Co., 33 S. Clark St., Chicago 3, Ill.
United States Graphite Co., 1621 Holland Ave., Saginaw, Mich.

IRON ORE

Acme Steel Co., Newport, Kentucky.

Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Company, Bethlehem, Pa.
Columbia-Geneva Steel Div., U. S. Steel Corp., 120 Montgomery, San Francisco, Calif.
Colorado Fuel & Iron Corp., Pueblo, Colorado.
Crucible Steel Co. of America, P. O. Box 88, Pittsburgh 30, Pa.
Detroit Steel Corp., Portsmouth, Ohio.
Ford Motor Co., 3000 Schaefer Road, Dearborn, Mich.
E. A. Godey & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
Granite City Steel Co., Box 387, Granite City, Ill.
Hanna Furnace Corp., Grant Bldg., Pittsburgh, Pa.
Inland Steel Co., 3210 Watling St., E. Chicago, Indiana.
Interlake Iron Corp., 1900 Union Commerce Bldg., Cleveland 14, Ohio.
International Harvester Co., 180 No. Michigan Ave., Chicago 1, Ill.
Jones & Laughlin Steel Corp., 401 Liberty Ave., Gateway Center, Pittsburgh 30, Pa.
Kaiser Steel Corp., P. O. Box 217, Fontana, Calif.
Lone Star Steel Co., P. O. Box 9087, Dallas 5, Tex.
National Steel Corp., Grant Bldg., Pittsburgh, Pa.
Pittsburgh Steel Co., Grant Bldg., Pittsburgh, Pa.
Republic Steel Corp., Republic Bldg., 25 Prospect Ave., N. W. Cleveland 1, Ohio.
Sharon Steel Corp., Sharon, Pa.
Shenango Furnace Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal & Iron Div., U. S. Steel Corp., P. O. Box 599, Fairfield, Ala.
U. S. Pipe & Foundry Co., Birmingham, Ala.
U. S. Steel Corp., 525 Wm. Penn Place, Pittsburgh 30, Pa.
Wheeling Steel Corp., Wheeling, West Virginia.
Woodward Iron Company, Woodward, Ala.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.
Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown 1, Ohio.

LEAD

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
American Metal Company, Ltd., 61 Broadway, New York 6, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
The Bunker Hill Co., Kellogg, Idaho.
Combined Metals Reduction Co., Felt Bldg., Salt Lake City, Utah.
The Consolidated Mining & Smelting Co., Ltd., Montreal, Canada.
Eagle Picher Co., Mining and Smelting Div., P. O. Box 910, Miami, Oklahoma.
E. A. Godey & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
International Bartering Co., 53 Broadway, New York 4, N. Y.
International Smelting & Refining Co., 25 Broadway, New York 4, N. Y.
Metal Traders, Inc., 67 Wall St., New York, N. Y.
National Lead Company, 111 Broadway, New York, N. Y.
Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
United States Smelting Refining & Mining Co., 75 Federal St., Boston, Mass.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

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American Potash & Chemical Corp., 3030 W. 6th St., Los Angeles 54, Calif.
Corning Glass Works, Corning, N. Y.
J. E. De Souza Co., Inc., 217 Broadway, New York 7, N. Y.
General Electric Co., Nela Park, Cleveland, Ohio.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
Pittsburgh Corning Corp., Port Allegany, Pa.

MAGNESITE AND BRUCITE

Basic, Inc., 845 Hanna Bldg., Cleveland 15, Ohio.
Corhart Refractories Co., (Corning Glass Works), 1662 West Lee St., Louisville, Ky.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland, Calif.
Northwest Magnesite Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
Pabco Products Inc., 1550 Powell St., Emeryville 8, Calif.
Standard Slag Co., 1200 Wick Bldg., Youngstown 1, Ohio.
Westvaco Chemical Division, Food Machinery & Chemical Corp., 161 E. 47th St., New York, N. Y.

MANGANESE ORE

(Metallurgical-grade)

Associated Metal & Minerals Corp., 75 West St., New York 6, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corp., Pueblo, Colorado.
Electro Manganese Div., Foote Mineral Co., Knoxville, Tenn.
Electro Metallurgical Co., A Division of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
Keokuk Electro Metals Co., Keokuk, Iowa.
National Paint and Manganese Co., Lynchburg, Virginia.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Tennessee Products and Chemical Corp., American National Bank Bldg., Nashville Tennessee.
Tenn-Tex Alloy and Chemical Corp., 500 1st American National Bank Bldg., Nashville 3, Tenn.
United States Steel Co., 525 William Penn Place, Pittsburgh 30, Pa.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Battery and Chemical-grade)

Acme Battery Co., 200 Henry St., Stamford, Conn.
Burgess Battery Company, Freeport, Ill.
Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
General Electric Co., Nela Park, Cleveland, Ohio.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
E. J. Lavino & Co., 3 Penn Center Plaza, Philadelphia 2, Pa.
Mallory Battery Co., Div. of P. R. Mallory & Co., Inc., 13000 Athens Ave., Cleveland, Ohio.
National Carbon Co., P. O. Box 6087, Cleveland, Ohio.

Olin Mathieson Chemical Corp., 225 Winchester Ave., New Haven 4, Conn.
Ray-O-Vac Div., Electric Storage Battery Co., 212 E. Washington Ave., Madison, Wis.
Tennessee Eastman Corp., Kingsport, Tenn.

MERCURY

Allied Chemical Corp., The Solvay Process Div., P. O. Box 271, Syracuse, N. Y.
American Cyanamid Co., 39 Rockefeller Plaza, New York 20, N. Y.
American Meter Co., Erie, Pa.
Automatic Steel Products, Inc., Mercury Clutch Div., 1201 Camden Ave., S. W., Canton 6, Ohio.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Bailey Meter Co., 1052 Ivanhoe Rd., Cleveland 10, Ohio.
J. T. Baker Chemical Co., Phillipsburg, N. J.
F. W. Berk & Co., Inc., Woodbridge Div., Box 38, Woodridge, N. J.
Coast Chem. Div., 275 Brandon St., San Francisco, Cal.
E. I. du Pont de Nemours & Co., Inc., Methods Div., Du Pont Bldg., Wilmington 99, Del.
General Aniline & Film Corp., General Aniline Works Div., 435 Hudson St., New York 14, N. Y.
General Color Co., 24 Avenue B, Newark 5, N. J.
General Electric Co., Purchasing Dept., 1 River Road, Schenectady 5, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
International Hartering Co., 52 Broadway, New York 4, N. Y.
International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
Mallinckrodt Chemical Works, Jersey City 5, N. J.
Mathieson Chemical Co., Baltimore, Md.
Merck & Co., Inc., Lincoln Ave., Rahway, N. J.
The Mercoid Corp., 4201 Belmont Ave., Chicago 41, Ill.
Metalsalt Corp., 200 Wagaraw Rd., Hawthorne, N. J.
Minneapolis Honeywell Regulator Co., 2753 4th Ave. S., Minneapolis 8, Minn.; Brown Instrument Div., 4331 Wayne Ave., Philadelphia, Pa.
Phillips Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
Phillips Petroleum Co., Bartlesville, Okla.
Quicksilver Products Inc., 407 Sansome St., San Francisco 11, Calif.
Thomas A. Edison, Inc., Primary Battery Div., Bloomfield, N. J.
Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, N. J.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.
Wyandotte Chemical Corp., Wyandotte, Mich.

MICA

(Buyers of Muscovite Block, Film Mica, and Phlogopite Block Mica)

Aerovox Division, Aerovox Corp., 740 Belleville Ave., New Bedford, Mass.
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Ashville Mica Co., P. O. Box 318, Newport News, Va.
Carpenter & Phillips, Box 657, Spruce Pine, N. C.
Cornell-Dubilier Electric Corp., 55 Cromwell St., Providence 7, R. I.
Diamond Power Specialty Corp., P. O. Box 415, Lancaster, Ohio.
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Micacraft Products, Inc., 701 McCarter Highway, Newark 5, N. J.
Reliance Mica Co., 341 39th St., Brooklyn, N. Y.
Spruce Pine Mica Co. and Mayland Mfg. Co., Spruce Pine, N. C.
The Tar Heel Mica Co., Inc., Plantree, N. C.
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

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American Electrical Heater Co., 6110 Cass Ave., Detroit, Michigan.
Cleveland Mica Co., 1360 Hird St., Lakewood, Ohio.
Continental-Diamond Fibre Co., Valparaiso, Indiana.
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Mica Insulator Company, 757 Broadway, Schenectady, New York.
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Westinghouse Electric Corp., P.O. Box 472, Irwin, Pa.

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Deneen Mica Co., Burnsville, N. C.—Dry.
Diamond Mica Co., Spruce Pine, N. C.—Wet.
English Mica Co., Spruce Pine, N. C.—Wet and Dry.
Franklin Mineral Products Co., Box 38, Franklin, N. C.—Wet and Dry.
The Funkhouser Co., Hartwell, Georgia—Dry.
Imperial Milling Co., 2738 Merced Ave., El Monte, Calif.
Kings Mountain Mica Co., Inc., Box 709, Kings Mountain, N. C.—Dry.
Southern Mica Co., Johnson City, Tenn.—Dry.

MOLYBDENUM CONCENTRATES

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Crucible Steel Co. of America, Pittsburgh, Pa.
International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
Molybdenum Corp. of America, 375 Park Ave., New York, N. Y.
Republic Steel Corp., Canton, Ohio.
S. W. Shattuck Chemical Co., Denver, Colo.
Union Carbide Metals Co., Niagra Falls, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

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American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Cosmo Metal Alloys Co., 275 Front St., New York, N. Y.
Philipp Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
Sulmet Alloys Co., Inc., Wellington St. and Erie R.R., Clifton, N. J.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
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Panacalite Pacific, Inc., 545 E. 60th St., Los Angeles 1, Calif.
Paramount Perlite Co., 1423 S. Illinois St., Paramount, Calif.
Supreme Perlite Co., P.O. Box 46, North Portland, Oregon.
Silbrico Corp., 5901 W. 66th St., Chicago 38, Ill.

PLATINUM

J. Bishop & Co. Platinum Works, Malvern, Pa.
Handy & Harman, 82 Fulton St., New York 7, N. Y.
Johnson, Matthey & Co., Inc., 698 Fifth Ave., New York 20, N. Y.
Mercantile Metal & Ore Corp., 595 Madison Ave., New York 22, N. Y.
Rodman & Yarusso Refining Co., 21 W. 47th St., New York 19, N. Y.
Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.
Western Gold & Platinum Works, 525 Harbor Blvd., Belmont, Calif.

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American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
The Anaconda Co., 25 Broadway, New York 4, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Baugh Chemical Company, Baltimore, Maryland.
Davidson Chemical Corporation, 20 Hopkins Place, Baltimore 3, Maryland.
Forte Mineral Company, 18 West Chelton Ave., Philadelphia 44, Pa.
General Chemical Division, Allied Chemical & Dye Corp., P. O. Box 4040, Denver, Colorado.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Stauffer Chemical Company, 634 California St., San Francisco 8, Calif.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

RARE-EARTH ORES

(Cerium ores, monazite sand, bastnaesite, other thorium-bearing ores)

Davidson Chemical Div., W. R. Grace and Co., Rare Earths Dept., Box 488, Pompton Plains, N. J.
Derby & Co., 551 Fifth Ave., New York 7, N. Y.
J. E. De Sousa Co., Inc., 317 Broadway, New York 7, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Grace & Co., W. R. Hanover Square, New York City, N. Y.
Lindsay Chemical Div., American Potash & Chemical Corp., 272 Ann St., West Chicago, Illinois.
Mallinckrodt Chemical Works, 2nd and Mallinckrodt Sts., St. Louis 7, Mo.
Maywood Chemical Works, Maywood, N. J.
Molybdenum Corp. of America, 500 Fifth Ave., New York, N. Y.

C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.

SELENIUM

Allied Chemical Corp., 40 Rector St., New York 6, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 4, N. Y.
International Barring Co., 52 Broadway, New York 4, N. Y.
International Smelting & Refining Co., 25 Broadway, New York, N. Y.
Kawechi Chemical Co., Boyertown, Pa.

SILICA

(Possible Buyers Exclusive of Glass Manufacturers)

Commercial Minerals Co., 319 Irwin St., San Francisco
Great Lakes Foundry Sand Co., 720 United Artist Bldg., Detroit 26, Mich.
Industrial Minerals and Chemical Co., 836 Gilman, Berkeley, Calif.
Industrial Silica Corp., Stambaugh Bldg., Youngstown, Ohio
Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland, Calif.
Linde Air Products Co., 30 East 42nd St., New York, N. Y.
Minerals and Insulation Corp., 45 Central Ave., Rochelle Park, New Jersey
Silicone Insulation Co., Inc., Butler Place Bronx 61, N. Y.
Tennessee Products & Chemical Corp., 512 First American National Bank Bldg., Nashville, Tenn.

SPODUMENE

Corning Glass Works, Corning, N. Y.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, Pa.
Foote Mineral Co., 18 E. Chelton Ave., Philadelphia 44, Pa.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
Lithium Corp. of America, Inc., Rand Tower, Minneapolis 2, Minn.
Maywood Chemical Works, Maywood, N. J.
National Enameling and Stamping Co., 270 N. 12th St., Milwaukee, Wis.
Owens Corning Fiberglas Corp., Newark, Ohio.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.

STRONTIUM ORES

Associated Metals & Minerals Corp., 40 Rector St., New York, N. Y.
J. T. Baker Chemical Co., Phillipsburg, N. J.
Barium Products, Ltd., Modesto, Calif.
Barium Reduction Corp., Charleston, W. Va.
E. I. du Pont de Nemours & Co., Inc., 11th & Orange Sts., Wilmington, Del.
Foote Mineral Co., Inc., 12 E. Chelton Ave., Philadelphia, Pa. (minerals).
General Electric Co., 1 River Road, Schenectady, N. Y.
Chas. Hardy, 415 Lexington Ave., New York, N. Y.
Harshaw Chemical Co., 1933 E. 97th St., Cleveland, Ohio.

TALC

(Producers and Grinders of Crude Talc, Pyrophyllite and Soapstone)

Alberene Stone Corp. of Va., Schuyler, Va.
Blue Ridge Talc Co., Inc., Henry, Va.
Carolina Pyrophyllite Co., Staley, N. C.
Commercial Minerals Co., 310 Irwin St., San Francisco, Calif.
Eastern Magnesia Talc Co., Inc., 206 Bank St., Burlington, Vt.

Glendon Prophyllite Co., Staley, N. C.
Gouverneur Talc Co., Inc., Gouverneur, N. Y.
Huntley Industrial Minerals, Inc., Box 305 Bishop, Calif.
Industrial Minerals & Chemical Co., 6th & Gilman St., Berkeley, Calif.
Southern Talc Co., Chatsworth, Ga.
Southwestern Talc Corp., Llano, Texas.
Stauffer Chemical Co., P. O. Box 68, N. Portland, Ore.

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TIN

American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
Grace & Co., W. R., Hanover Square, New York City, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Vulcan Detinning Div., Vulcan Materials Co., Sewaren, N. J.
Wah Chang Corp., Woolworth Bldg., New York 7, N. Y.

TITANIUM MINERALS

(Titanium Metal Manufacturers—Ilmenite and Rutile)

Cramet Inc., 3800 N. Hawthorne St., Chattanooga, Tenn.
Dow Chemical Co., Midland, Mich.
E. I. du Pont de Nemours and Co., Inc., DuPont Bldg., Wilmington 98, Del.
Electro Metallurgical Co., Div. of Union Carbide and Carbon Corp., Ashtabula, Ohio and 30 East 42nd St., New York 7, N. Y.
Titanium Metals Corp. of America, 233 Broadway, New York, N. Y.

(Pigment Manufacturers—Ilmenite)

American Cyanamid Co., Pigments Div., 39 Rockefeller Plaza, New York 20, N. Y.
E. I. du Pont de Nemours and Co., Inc., DuPont Bldg., Wilmington 98, Del.
The Glidden Co., Chemicals-Pigments-Metals Div., 900 Union Commerce Bldg., Cleveland 14, Ohio
National Lead Co., 111 Broadway, New York 6, N. Y.
New Jersey Zinc Co., Gloucester City, N. J.

(Welding Rod Manufacturers—Ilmenite and Rutile)

American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.
Stoody Co., Slauson Ave. at Sorenson, Whittier, Calif.
Westinghouse Electric Corp., Box 2278, Pittsburgh 30, Pa.

(Alloy Manufacturers—Ilmenite and Rutile)

Aluminum Co. of America, 1501 Alcoa Bldg., Washington 6, D. C.
Titanium Alloy Manufacturing Co., Div. of National Lead Co., Box C, Bridge Station, Niagara Falls, N. Y.
Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., New York 17, N. Y.

(Dealers—Ilmenite)

J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
E. A. Godoy & Co., Inc., 250 Broadway, New York 4, N. Y.
Metallurg, Inc., 99 Park Ave., New York 16, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York, N. Y.

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Berkshire Chemicals, Inc., 420 Lexington Ave., New York 17, N. Y.

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 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 International Titanium Corp., 100 Park Ave., New York 17, N. Y.
 Metal Traders Inc., 67 Wall St., New York 5, N. Y.
 Oretraction Inc., 7425 Thomas St., Pittsburgh 8, Pa.
 Phillip Bros., Inc., 76 Pine St., New York 5, N. Y.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 Wah Chang Corporation, Woolworth Building, New York 7, N. Y.

TUNGSTEN CONCENTRATES

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 Braeburn Alloy Steel Co., Div. of Continental Copper & Steel, Inc.,
 Braeburn, Pa.
 Colonial Steel Co., Monaca, Pa.
 Columbia Tool Steel Co., Chicago Heights, Ill.
 Continental Ore Corp., 500 Fifth Ave., New York 36, N. Y.
 J. E. De Souza Co., Inc., 217 Broadway, New York 7, N. Y.
 Derby & Co., 16 Cedar St., New York 5, N. Y.
 Fansteel Metallurgical Corp., 2200 Sheridan Road, North Chicago, Ill.
 Fifth Sterling Steel & Carbide Corp., McKeesport, Pa.
 General Electric Co., Cleveland Wire Works, Lamp Dept., 1331 Char-
 don Road, Euclid 17, Ohio.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Grace & Co., W. R., Hanover Square, New York City, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Joseph Steel Co., Washington, Pa.
 Kennametal, Inc., Latrobe, Pa.
 Latrobe Steel Co., Latrobe, Pa.
 Metallurg, Inc., 99 Park Ave., New York, N. Y.
 Molybdenum Corp. of America, 500 5th Ave., New York, N. Y.
 Salt Lake Tungsten Co., 2160 Indiana Ave., Salt Lake City, Utah.
 Simonds Saw and Steel Co., Lockport, N. Y.
 Sylvanis Electric Products Co., Tungsten & Chemical Division, Box 78,
 Tewando, Pa.
 Union Carbide Nuclear Co., 39 E. 42nd St., New York, N. Y.; Bishop,
 Calif.
 Universal Cyclops Steel Corp., Bridgeville, Pa.
 Vanadium Alloy Steel Co., Latrobe, Pa.
 Wah Chang Corporation, Woolworth Building, New York 7, N. Y.
 Vulcan Crucible Steel Co., Alliquippa, Pa.
 Westinghouse Electric Corp., 1-17 MacArthur Ave., Bloomfield, N. J.

URANIUM ORES

Mills in Operation

Anaconda Company, Bluewater, (Grants) New Mexico
 Climax Uranium Co., Grand Junction, Colo.
 Dawn Mining Co., Ford, Stevens County, Washington
 Freemont Minerals Inc., Riverton, Wyo.
 Gunnison Mining Co., Gunnison, Colo.
 Homestake-New Mexico Partners, Grants, N. Mex.
 Homestake-Sagin Partners, Grants, N. M.
 Kermac Nuclear Fuels Corp., Grants, N. M.
 Kerr McGee Oil Industries, Inc., Shiprock, N. Mex.
 Lakeview Mining Co., Lakeview, Ore.
 Lucky Mc, Riverton, Wyoming

Mines Development, Inc., Edgemont, S. Dak.
 National Lead Co., Monticello, Utah
 Phillips Petroleum Co., Grants, N. M.
 Rare Metals Corp. of America, Tuba City, Ariz.
 Texas Zinc Minerals Co., Mexican Hat, Utah
 Trace Elements Corp., Maybell, Colo.
 Union Carbide Nuclear Co., Rifle and Uravan, Colo.; Greenriver, Utah
 Uranium Reduction Co., Moab, Utah
 Vanadium Corp. of America, Durango, Colo.
 Viro Uranium Co., Salt Lake City, Utah
 Western Nuclear Corp., Split Rock, Wyoming

ZINC

The American Metal Co., Climax, Inc., 61 Broadway, New York 6, N. Y.
 American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
 American Zinc Co. of Illinois, 1600 Paul Brown Bldg., St. Louis, Mo.
 The Anaconda Co., 25 Broadway, New York 4, N. Y.
 Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 The Athletic Mining and Smelting Co., Ft. Smith, Ark.
 The Bunker Hill Co., P. O. Box 29, Kellogg, Idaho.
 Combined Metals Reduction Co., Felt Bldg., Salt Lake City, Utah.
 E. I. du Pont de Nemours & Co., 1007 Market St., Wilmington 98, Del.
 Eagle-Picher Co., Mining & Smelting Div., Miami, Okla.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 W. R. Grace & Company, Hanover Square, New York, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 International Minerals & Metals Corp., 11 Broadway, New York 4, N. Y.
 Matthiessen & Hegeler Zinc Co., La Salle, Ill.
 Metal Traders, Inc., 26 Wall St., New York, N. Y.
 New Jersey Zinc Co., 160 Front St., New York 7, N. Y.
 Phillip Bros. Ore Corp., 70 Pine St., New York 5, N. Y.
 St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
 The Sherwin-Williams Co., Osark Smelting & Mining Division, 101
 Prospect Ave., N.W., Cleveland 1, Ohio.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia 3, Pa.

ZIRCON

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 Berkshire Chemicals, Inc., 428 Lexington Ave., New York 17, N. Y.
 Cohart Refractories Co., 1600 W. Lee St., Louisville, Kentucky.
 Derby & Co., 16 Cedar St., New York 5, N. Y.
 J. E. De Souza Co., Inc., 217 Broadway, New York 7, N. Y.
 Electro Metallurgical Div., Union Carbide & Carbon Corp., 30 E. 42nd
 St., New York 17, N. Y.
 Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 International Titanium Corp., 100 E. 42nd St., New York 17, N. Y.
 Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y.
 Metal Traders Inc., 67 Wall St., New York 5, N. Y.
 Metallurg, Inc., 100 Park Avenue, New York 17, N. Y.
 Oretraction, Inc., 7505 Mead St., Pittsburgh, Pa.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
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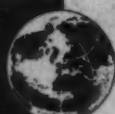


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1959 Directory of Major United States Mining Operations

ABBREVIATION CODE USED IN THIS DIRECTORY ONLY

Accountant	acct
Assistant	asst
Brothers	bros
Chairman	chmn
Chemical	chem
Chief	ch
Company	co
Concentrator	concen
Consolidated	consol
Corporation	corp
Creek	cr
Development	devel
Director	dir
District	dist
Division	div
East	E
Electrical	elec
Engineer	eng
Flotation	flot
Foreman	frm
General manager ..	gen mgr
Geologist	geol
Gravity	grav
Heavy media ..	heav-med
Hydraulic	hydraul
Incorporated	inc
Limited	ltd
Manager	mgr
Mechanical	mech
Metallurgist	met
Mile(s)	mi
Milling	mlg
Mining	mng
North	N
Operations	oper
Operator	op
Owner	own
Partner	part
President	pres
Production	prod
Purchasing agent ..	purch agt
Secretary	sec
South	S
Superintendent ..	supt
Surveyor	surv
Treasurer	treas
Underground	undergr
Vice president	VP
West	W
Yearly	yrly

A CAREFUL SURVEY OF SOME 4,000 MINING and allied processing operations, both active and dormant, was the basis of this list of United States mining operations. While MINING WORLD cannot guarantee 100 percent accuracy for this directory, it believes that the list is the best such reference available to the mining industry from any source.

FOR THE GREATEST POSSIBLE UTILITY operations are listed alphabetically by state. Listings are carried under the name of the operating company, owner, mine, or individual operator, according to the wishes of the parties concerned. In cases where properties are commonly known by more than one name, cross references were used where possible. Major companies have more than one listing. Properties and key personnel are listed by states in which the mines are located. There is a cross reference to company executive headquarters and to all other states in which the company operates.

QUESTIONNAIRE FORMS covering major operating details and personnel were mailed over a period of six months. Where information supplied by the operator or owner was not complete, supplementary data was obtained from field reports compiled by staff members, records furnished by the MINING WORLD news bureau, and information from federal and state mining agencies, the United States Atomic Energy Commission, many state geologic departments, state conservation commissions, and state and regional mining associations. Special thanks are extended to the U. S. Bureau of Mines and its regional engineers for help in checking operating properties.

THE PROPERTIES WERE ALL ACTIVE and producing when surveyed, except where "under development" and "idle" have been added. It should be noted especially that there are large and important mines listed in the "idle" class in this directory. This is a temporary situation due to low metal prices. Most of these properties are being kept in good physical repair, water is being pumped from the mines, and they can be placed back in operation within a very short time when management gives the go ahead sign. Totally inactive properties with no indication of future resumption of operations were deleted. Tonnages listed are for daily production, unless otherwise noted. Minerals and metals are listed in order of importance. Key personnel are listed under the address where they may be reached, and unless otherwise specified mill and smelter addresses are the same as those given for the mines.

A SPECIAL NOTE ABOUT URANIUM COMPANIES. Only those uranium companies that are actually operating and/or reportedly made uranium ore shipments in 1958 are listed in this directory. Although MINING WORLD contacted several hundred more uranium companies and hope-to-be uranium companies than are listed on the following pages, only those which gave proof of actually being in the process of production, development, or exploration work were included. Mining companies, mine operators, etc., are listed in the state in which ore was actually mined. Headquarters of the company (producing unit) are then listed and address given even though in another state; which is often the case.

IF YOUR MINE WAS NOT LISTED in this year's directory, fill out the form below, tear it out of the book along the dashed line and mail it to MINING WORLD, 500 Howard Street, San Francisco 5, California, and your name will be added to the list receiving questionnaires for next year's directory section.

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ATTENTION: New Mine Operators—Unlisted Mine Operators

LIST YOUR MINE IN THE 1959 MINING YEARBOOK MINE DIRECTORY SECTION

To receive questionnaire for listing your mine complete and mail this form to:

Editor, MINING WORLD
300 Howard Street
San Francisco 5, California

Your Name

Your Address

Your City State

Mining Company

ALASKA

AGOFF, HARRY

c/o Prince Cr Mng Co, Flat
PLACER Prince Cr, Matarod
dist, nonfloat, Au

ALASKA EXPLORATION
& MINING COMPANY

Box 136, Pullman, Wash
Pres: Frank P Beach
VP: Harvey Mays
Sec-Treas: Raymon Smeltz
BIRD CREEK PLACER, Talheena
(Under lease to: Trepsie, Blair
Bro & Barney)

ALASKA METALS MNG CO

Box 965, Fairbanks
HYPOWICH & GOLBERT
PROPERTY
LODE MINES, Gilmore Dome,
Fairbanks dist, WOs
Under devel

ALASKA NICKEL CO

c/o Fred Jenkins, Eagle
LODE MINE, Flame Cr, Eagle
dist, Au
Under devel

ALASKA PACIFIC CONS
MNG CO

519 Colman Bldg, Seattle, Wash
Pres: V A Montgomery
VP & Gen Mgr: Wm M Stoll
Sec: Carl W Elman
INDEPENDENCE MINE, 25 N of
Wasilla, undergr
Idle
100-TON FLOT-AMAL MILL
Idle

ALDER CREEK MNG CO

Box 1895, Fairbanks
Part: Martin Sather, Jr
PLACER 34 mi N of Fairbanks,
Au

ALLUVIAL GOLDS, INC

Coal Creek
Pres & Gen Mgr: Ernest H Patty
Dir: Walter Seligman, EDBull
Mrs. A D McElae
PLACER on Woodchopper Cr,
Circle dist, Yukon rtr region,
4 ft dredge, Au

BARTHOLOMAE, WM A

P O Box 248, Dora, Calif
Pres & Gen Mgr: W A Bartholomae
GOLD PLACER MINE, Gold Run
Cr, Port Clarence
GOLD MINE, Ester Dome, via
Fairbanks
Eng: B W Vallat
Idle

BITTNER, PAUL

Central
PLACER Deadwood Cr, Circle
dist, hydraulic, Au, Ag

BLISS & SONE

Ungalik
PLACER, Bonanza Cr, hydraulic-
doser, Au

CANYON CREEK MNG CO

Aktah
Gen Mgr: Jens A Kvammo
PLACER on Canyon Cr, Aniak
dist, Kuskokwim R reg, dozer
shovel plate-hydraulic, Au

CARLSON, IVAR C

Ophis
MINE, Little Cr, Innoho dist,
Au

CARSTENS, HEINE, C &
DELTA

Alaska Co, Central
PLACER, Portage Cr, Circle
dist, Au

CHANDALAR MNG CO

413 3rd Ave, Anchorage
Op: Hugh Matheson, Jr
PLACER, Big, Chandalar dist,
nonfloat, Au

CHATHAM CREEK MNG CO

Box 81, Fairbanks
Berg, Twitton & Wickstrom
PLACER, Last Chance Cr, Fair-
banks dist, Yukon R reg, drag-
line-doser, Au

COLLINSVILLE MINES,
A PARTNERSHIP

1557 H St, Anchorage
GOLD PLACER, 2,000-yd drag-

line & nonfloat wash pl, 109 air
mi NW of Anchorage
Frm: Carl Durand
Under devel

CROWN POINT MINES

Box 1417, Seward
Gen Mgr: Ansoo E Gouldberry
CROWN POINT MINES, undergr,
Au
MILL, Mile 25, Seward

DAHL CREEK MINE

706 - 3th Ave, Fairbanks
Op: C E Bunt
PLACER, Dahl Cr, Strongah
dist, Au

DE COURSEY MT MNG CO

Red Devil
Pres: Ray Wolfe
VP: Robert F Lyman
Sec-Treas: H R Heard
RED DEVIL MINE, Red Devil
undergr, Hg
Asst Gen Mgr: Robert F Lyman
Asst Gen Mgr: Warren L Rice
Eng: Dorr Holloway
Geol: Gordon W Herried
Prod: 30 tons
DE COURSEY MINE, 20 mi N
of Crooked Cr, Hg
Idle

RED TOP MINE, Marsh Mt,

Alotagvik, Hg
Explor
WILLIS GROUP, 5 mi NW of
Red Devil
Idle

DONLIN PLACERS

Crooked Creek
Own: Robert F Lyman
PLACER in Snow Gulch 18 mi N
of Crooked Cr, Aniak dist,
Kuskokwim Riv reg, dozer, Au
Idle

EDGEUMBE

EXPLORATION CO
218 S Hudson, Pasadena 5,
Calif
Box 758, Sitka
Pres: C T Morgan
Treas-Gen Mgr: G H Morgan
Sec: A Holden
ECHO MINE, Silver Bay,
Undergr, Au, Ag
Idle

ECHO GRAY MILL at Silver Bay

(See Calif)
FAR NORTH DEVELOPMENT
CO, INC
1105 Shenandoah Dr, Seattle 2,
Pres: John Bullock
VP: Asa Martin
Sec-Treas: E L Dreitzler
Oper Part: John W Raymond
Frederick D Parker
PLACER, Canfield, Au
Mrgs: Frederick Parker,
John Raymond

FERN GOLD MNG CO

502 Columbia Bldg, Spokane,
Wash
Pres: J L Drumheller
VP: Martin Waldor
Sec: L B Gordon
FERN MINE, Palmer, undergr,
Au
Idle

FLAT CREEK PLACERS

McGrath
Part: John E & Richard S
Fullerton
PLACER, Flat Cr, Au, Ag
Prod: 2,000 cu yds

FRANKLIN MNG CO

Tok Junction
Part: Howard Bayless, Dick
Roberts, Bob Roberts &
Ellis Roberts
PLACERS at Franklin &
Chicken, hydraulic, dragline,
doser, Au

FREMONT MNG CO

400 Torrey Bldg, Duluth 2,
Minn
Main Part: Warren S Moore
Ch Geol: John P McKee
Exploration

GOLD PLACERS, INC

Coal Creek
Pres & Gen Mgr: E H Patty
VP: Walter Seligman
Dir: E H Bull &
Mrs A D McElae
PLACER, Circle dist, Au, 4 ft
dredge
Idle

GOLD STREAM MNG CO

Box 2116, Fairbanks
Pres: D G Ewald
VP: Emil Unshell
Sec: Charles Clabby
PLACER, Goldstream Cr, near
Fox, nonfloat, Au
Mine Frm: Henry Falke

GOODNEWS BAY MNG CO

INC
422 White Bldg, Seattle 1, Wash
Pres: Andrew O Olson
VP & Gen Mgr: Edward Olson
Sec: G D Connor
Treas: C J Johnston
GOODNEWS BAY PLACER,
Platinum
Gen Mgr: Edward Olson
Asst Gen Mgr: John W Weeks

GRANITE CREEK MNG CO

Ruby
Pres: Wm Carlo
VP: Wm Carlo, Jr
Sec: F Carlo
PLACER on Ophi Cr, 50 mi S
Ruby, Yukon region, hydraulic-
doser, Au

GRANT CREEK MNG CO

Tanana, P O 53
Part: Lars Indegard,
Frank C Edgington
PLACER, Grant Cr, approx 25
mi W of Tanana, Au

HASSEL MNG CO

Box 1071, Fair
PLACER, Ready Bullion Cr,
Fairbanks dist, Au
Prod: 800 yds

HOLMES, WALTER L

May Creek via Cordova
REX CREEK MINE, Nisina dist,
May Cr, Vin Cordova, placer,
open pit, hydraulic, Au
Under devel

HUNTER CREEK MNG CO

c/o Melo Jacobovich, Rampart
PLACER on Hunter Cr, Rampart
dist, hydraulic-doser, Au
Idle

HYDER MINES, INC

904 4th Ave, Seattle 4, Wash
Pres: Donald H McNelly
VP: Edward E Wheat
1st VP: Mike Welach
Sec: J W Boothe
Treas: Dr Robert L Cumber
RIVERSIDE & CANTU MT MINES,
Hyder, undergr, Pb, Ag, Au,
Wg, Cu, Zn

MINES Supt: Carl C Wikstrom

Geol-Met: Henry L Hill & Assoc
Prod: 30 tons
50-TON FLOT MILL, Riverside
Mill Supt: Carl C Wikstrom

I L & M MNG CO

Box 7015, Kenai
Pres: Les Hollenback
VP: Irma Hollenback
Sec: Charles W Miller
I L & M MINE, Kenick Bay
Ketchikan dist, UOg
Idle

INMACHUK MNG CO

Box 272, Nome
INMACHUK MINE, Deering
Gen Mgr: Grant H Nelson
Prod: 2,000 yd

KENAI CROMO CO

945 E 4th St, Anchorage
Part: John G Bachner
Part & Gen Mgr: Mike E Seiler
STAR NO 4 MINE, Ret Mt,
Homer Cr, undergr, CrOg
Asst Gen Mgr: Karl A Bachner
Mine Frm: Norman Crooks
Idle

30-TON ROD MILL, at mine

Mill Supt: Mike E Seiler
Idle
KENDRICK BAY MNG CO
Mines Part, Golden, Colo
Pres: Frank Coolbaugh
VP: W Ernest Jones
Sec: John P Fitz-Gibbon
Treas: Thomas E Congdon
KENDRICK BAY MINE, Prince
of Wales Island, Alaska, open
pit, UOg
Idle
(See Colo)

KODIAK EXPLORATION
CO, INC

Box 448, Kodiak
Pres: George H Cornelius
VP: Emil Knutsen

Treas: Robert von Scheele
Purch Agt: Ralph Johnson
Field Dir: Henry Neeth
KECO PING ROCK MINE, Kodiak
undergr, WOs, Cu, Au
Gen Mgr: Henry Neeth
Asst Gen Mgr: Tom von Scheele
Geol: Charles H Scott
Mech Eng: Walter Achen
CLAIMS, undergr, open pit,
placer, UOg, WOs, Au, Cu, Ni,
Co, Ag

KOUGAROK FREIGHT &
MNG CO

Box 137, Nome
Part: E C Strath & E Towser
PLACER, 11 mi NE of Nome, Au,
dredge
Idle

LAST CHANCE MNG CO

Box 939, Nome
Op: William S Muns
PLACER, Bluff, Au, Bucket-line
floating dredge

LEE BROS DREDGE CO

Solomon
Gen Mgr: Richard Lee
PLACER on Solomon Riv,
Seward Penin, bucket Au, Ag
Eng: Allan W Lee
Prod: 7,500 yds

LITTLE MINOOK MNG CO

Fairbanks
Pres & Gen Mgr: Albin Martin
PLACER on Little Minook Cr,
Rampart dist, dragline-
hydraulic-doser, Au, Ag
Prod: 800 yds

LONG CREEK MNG CO

Ruby
Gen Mgr: Hans Tilleason
PLACER at Long Cr, hydraulic-
doser-dragline, Au, Ag

LOST CHICKEN HILL
MINES, INC

2438 N Shore St, Chicago 45, Ill
c/o Len Knappe
PLACER, Lost Chicken Cr,
Fortymile dist, Au

LUCKY EIGHT MNG CO

Eagle
Op: Burnett F Hansen,
Borghild Hansen
PLACER, Crooked Cr, Au

LUCKY NELL MINE

Hollis
Own: J J Matuola
MINE, 7 mi W of Hollis, undergr,
Au, Ag, Pb, Cu
Under devel

PUYALLUP MINE, 1 1/2 mi W of

Hollis, undergr, Au, Ag
Under devel
CASCADE MINE, 3 mi SW of
Hollis, undergr, Au, Ag
Under devel

LUCKY SEVEN MINE

Miller House
Op: Walter Roman
PLACER, Mantodon Cr, Circle
dist, dozer-hydraulic, Au

MACLAREN RIVER
COPPER CORP

Box 1292, Fairbanks
Pres: Everett O Alberson
VP: Warren A Taylor
Sec-Treas: Jay Bannister
KATHLEEN-MARGARET MINE,
head of MacLaren Riv, undergr,
Cu, Au, Ag
Gen Mgr: E O Alberson
Under devel

Mc COMB, ROBERT

Chicken
MINE, S Fort Fortymile Riv,
Fortymile dist

MINERALS RESEARCH

2 Marine Way, Juneau
Exploration only

MISCOVICH BROTHERS

Poorman, Flat
Part: George Miscovich
John A Miscovich
Howard Miscovich
Andrew Miscovich
PLACER, Poorman, Au
Prod: 300,000 to 500,000 cu
yds yrlly

NATIVE BISMUTH, INC

Box 287, Nome
Pres & Gen Mgr: Richard L
Margraf
VP: D M Russell
CHARLEY CREEK BISMUTH
MINE, 35 mi N of Nome,
undergr, Bi, BiOg, Au
Idle

NEW YORK - ALASKA

GOLD DREDGING CORP
618 Smith Tower, Seattle,
Wash

Pres & Man Dir: J K Crowley
VP: GGC King
VP: Mark Mathewson
Sec: Letze G Robbins
Treas: Fannie Barley
Purch Agt: L E Robbins
NEW YORK - ALASKA MINE,
50 mi NE of Bethel, placer,
3 dredges, dragline, Au
Res Mgr: Wm H Race
Asst Mgr: M F Bailey
Mech Eng: Clarence Clark
(See Wash)

NORTH AMERICAN
DREDGE CO

Flat
Own: Alex Matheson
PLACER, Flat, Matarod dist,
2,900 yd bucketline, dredge, Au

NORTHERN LIGHTS MNG
CO

Ruby
Gen Mgr & Mech Eng:
Michael Carroll
PLACER, Ruby dist, Au

NOVATNEY, ROBT A

104 West 9th St, Juneau
Sec-Treas: Dorothy H Novatney
MILLER LEDGE & LODE, Helm
Bay, open pit, Au, Ag
Under devel

OLIVE CREEK MINES

Box 552, Fairbanks
Own-op: Carl Parker
PLACER on Olive Cr, 80 mi NW
of Fairbanks, dragline-doser,
Au, Ag
Prod: 800 cu yds

PEKOVICH, W S

Box 2642, Juneau
MINE, Port Snellisham, Juneau
dist, Fe
Under devel

PILGRIM, EARL R & CO

Box 1596, Fairbanks
Own & Gen Mgr: Earl R Pilgrim
STAMPED MINE, Stampede,
100 mi SW of Fairbanks, undergr,
sh

40-TON GRAY MILL

Idle
PITTS, E H
Big Lake
PITTS PLACERS, Big Lake,
hydraulic, Au, Ag

PRINCE CREEK MNG CO

Flat
Own: Harry Agoff
PLACER on Prince Cr, Matarod
dist, Yukon Riv region, hydraulic
Au

PROSPECTORS, INC

544 2nd Ave, Fairbanks
Chicken
PLACER on Myers Fork, 40 mi
dist, Yukon Riv region, dozer-
hydraulic, Au

PURKEYPILE, I W

320 3rd St, Hamilton Acres,
Fairbanks
GRANDVIEW MINE, 17 mi SW of
Mt Russell, open pit, Ag, Cu, Pb,
UOg, WOs, Zn
Gen Mgr: W W Purkeypile
Under devel

TOZIMORAN MINE, 30 mi W of

Tanana
Idle
QUEBEC METALL INC,
LTD
c/o J Bonkowski, Box 40,
Haines
PLACER & LODE, near Klutwan
Juneau dist, Fe
Under devel

ROSEANDER & REED

Ophi
Pres: T Roseander
PLACER, Yankee Cr, Innoho dist
hydraulic-doser-dragline, Au

SAVAGE, PAT
Ruby
PLACER, Long Cr

SCHAEFER, RUSSEL R
Aniak
CINNABAR CR PLACER, Kuskow
River, undergr, Hg
Prod: 10 tons
10-TON MILL, at mine

SELDOVIA CHROME CO
INC

Selkirk
Pres: John Little
VP: Dallas Newell
Sec: Frank Ruby
MINE, Seldovia, open pit, Cr
Mile

SLATE CREEK MNG CO
Box 1564, Fairbanks
PLACER, Slate Cr, Koyukuk dist,
Au, Ag

SOUTH FORK MINING CO
Chicken
Own: R S McCombe
Sec: Muriel McCombe
PLACER, doser-pump, Au

SQUAW CREEK MNG CO
Fairbanks
Op: Edwin C Gelvin
PLACER, Squaw Cr, Circle dist,
Au

STANICH BROS
Fairbanks
PLACER, Porcupine Cr, Koyukuk
dist, Au

STRANDBERG MINES, INC
326 4th Ave, Anchorage
PLACER, Colorado Cr, Incho
dist, Indian Riv, Hughes dist,
Eureka Cr, Hot Springs dist, Au
LODE PROSPECT, Yentna dist,
Au
NIXON FORK MINE, McGrath
dist

**US SMELTING, REFINING
& MNG CO**
Box 1170, Fairbanks
VP & Gen Mgr, Alaskan Opr:
J D Crawford
FAIRBANKS DEPT, 7 gold dredges
in Fairbanks area
Mgr: J C Roswell
Mine Supt: T A Loftus
Dredge Supt: W A La Fon
Cashier: J L Reed
Prod: 6,000,000 cu yds gravel,
HOGATZA OPERATIONS, 1 gold
dredge
Supt: Ralph B Norris
Prod: 800,000 yds gravel
NOME DEPT, 3 gold dredges
Mgr: C S Glavinovich
Supt: W A Galvinovich
Cashier: Robert Baldwin
Prod: 3,000,000 cu yds gravel
(See Ariz, Mass, N Mex, Utah)

U S STEEL CORP
325 William Penn Pl, Pittsburgh
30, Pa
EXPLOR, SE Alaska
Under devel
(See Ala, Calif, Minn, Pa, Tenn,
Utah, Wyo)

UOTILA, Gus
Ophir
OPHR CR PLACER, Au

WACKWITZ, FRED
Box 1505, Fairbanks
PLACER, Bedrock Cr, Fairbanks
dist, shovelin, Au
LODE, head of Cleary Cr, Pb

WESTERN ALASKA MNG CO
Box 121, Spenard
Op: R J Anderson
MINE, Russian Mtns, Aniak dist,
Hg

WOLF CREEK MNG CO
Box 141, Fairbanks
Pres: Andrew Anderson
VP: Allan Caberg
Sec-Treas: Manie Olson
Asst VP: John Osberg
PLACER, Fish Cr, 30 mi N of
Fairbanks, Au
Under devel

ZAISER, CLARENCE
Ruby
PLACER on Greenstone Cr, drift,
Au

ALABAMA

**ALABAMA FLAKE
GRAPHITE CO**
320 Comer Bldg, Birmingham
Pres-Treas: W L Shumate Jr
VP: H B Robinson, B J Carder
Sec: W C Dempsey
Asst Sec: Joseph Sims
Properties lease to
INDUSTRIAL MINERALS CORP
1129 Vermont Ave NW, Wash
DC
Pres: M M Dana, Ashland, Ala
Sec: Marshall Stewart
Treas: Toni D Pittman
POCAHONTAS MINE, 4 1/2 mi
W of Ashland, Ala, open pit,
crackable graphite, mica
Under devel
500-TON FLOT MILL
Idle

AMERICAN TALC CO
Chatsworth, Ga
Pres: M Woodruff, J Glenn
VP: Francis T Glenn
Sec: J R Ferry
MINE, WINTERBORO, open pit,
Idle
Mine Supt: N R Davis
Prod: 100 tons
50-TON GRAVEL MILL, Alpine
Mill Supt: T E Davis
Intermittent operation
(See Ga)

ARRINGTON MNG CO
Cedarhurst, Ga
WASH PLANT, Glenwood,
Brundidge, Pike County, Fe

DIXIE MINES, INC
Box 385, Heflin
Pres & Treas: Ernest Kretsch-
mar
VP & Purch Agt: Joe W Bailey
Sec: Robert Abbott
Adm Asst to Mgr: Eldridge
Laudermilk
SHEFFNER MINE, Micaville,
open pit, mica
Gen Mgr: Joe W Bailey
Geol: E C Van Horn
Mine Frm: Glenn Gibson
MILL, wash, screen tabling
-Mill Frm: Almond Hughes

GLENWOOD MNG CO, INC
Glenwood
Pres & Gen Mgr: I D Gibson
VP & Asst Gen Mgr: CB Gibson
Sec-Treas: D F Jackson, Sr
GLENWOOD MINES, open pit,
Fe
Gen Supt: H A Patton
Mech Eng: M G Cornett
Prod: 1,000 tons
MILL
Mill Supt: W D McLeod
Asst Mill Supt: H H Patton

REPUBLIC STEEL CORP
P O Box 2394, Birmingham 2
EDWARDS MINE, undergr, Fe
Gen Mgr: B H McCrackin
Mech Eng: A E Higgenbotham
Elec Eng: T A McDougal
Ch Eng: R B Watt
Mine Supt: B C Jones
Mine Frm: A B Bessley
Mine Eng: T P Castelle
Prod: 3 500 tons
SPAULDING MINE, undergr,
open pit, Fe
Mine Supt: J G Blackwell
Mine Frm: J E Jackson
Idle
(See Mich, Minn, NY, Ohio)

**SHOOK & FLETCHER
SUPPLY CO**
1814 1st Ave N, Birmingham
Pres: P G Shook
VP: A M Shook, III
Sec-Cont: H O Thomas, Jr
Purch Eng: L M Quick
BLACKBURN & WARNER MINES
Russellville, surface, Fe
Gen Mgr: E H Craddock
ADKINS MINE, Woodstock,
surface, Fe
Gen Mgr: H C Gunter
Prod: 2,500 tons
TATTS GAP MINE, surface, Fe
(See Mo)

SMITH MNG CO, THE
Laverne
SMITH BROWN ORE MINE, Fe

U S PIPE & FOUNDRY, CO
3300 1st Ave N, Birmingham
Pres: C S Lawson
VP: R E Garrett
Sec: J W Brennan
Treas: W S Wilson
Purch Agt: H E Cross
Gen Supt: J W Nicol
Geol: Jack E Morris
Mng Eng: Geo Jones
Met: R H Stacey
Elec Eng: L E Shiffman
Safe Eng: J A Downey
RUSSELLVILLE MINE, 5 mi SW
Russellville, surface, Fe
Supt: S A Britton
Frms: Hobart Horton,
H McAllister
HEAVY MILL
Prod: 2,000 tons of (brown)
ore
BLAST FURNACES, Birmingham
Gen Supt: Dan Watkins
RUFFNER #3 MINE, Irondale,
1 mi E of Birmingham, undergr,
Fe (red ore)
BLOSS #2, Bessemer, 12 mi W
of Birmingham, undergr, Fe
(red ore)
Supt: J W Russell
Asst Supt: P M Snow

U S STEEL CORP
TENNESSEE COAL &
IRON DIV
P O Box 599, Fairfield
Pres: A V Wiebel
Exec VP: J W Kinnear Jr
VP-Oper: W E Crouch Jr
Mgr, Raw Mat: W S Springer
Ch Eng Raw Mat: L C Toague
IRON ORE CAPTIVE MINES &
COND PLANT, & undergr mines
near Bessemer
Cap: 4,981,600 net tons
crude iron ore yrly
Gen Supt, Ore Mines & quarry:
A W Beck Jr
Supt #7, 8, 9 & 10 mines:
P J Zukow
Supt #11 & 14 Mines & Dolomah
quarry: R W McEniry
Supt Ore cond plant: G M Neal
(See Alaska, Calif, Minn, Pa,
Tenn, Utah, Wyo)

**WILSON, D M, BAUXITE
CO**
Eufaula
ONLEE MINE

WILSON, R E, MNG CO
Eufaula
Pres: R E Wilson
Sec: Betty Richards
EUPAULA MINES, bauxite
Prod: 80 tons
80-TON MILL, Eufaula
Supt: Paul Taylor

WOODWARD IRON CO
Woodward
Chmn of Bd: John E Urquhart
Pres: W R Bond
VP: John Hager
VP-Sec: D T Turnbull
Treas: W R Cottrell Jr
Met: F U Leonard
Safe Eng: Stanley Mooney
Purch Agt: H K Stokes
PYNE MINE, 6 mi S of Bessemer,
undergr, Fe
Mine Supt: T W Davis
Asst Mine Supt: W H Thompson
Mine Eng: S E Sullivan
BLAST FURNACE, Woodward
Supt: W W Price Jr
Asst Supt: C Y Huff
Prod: 772,632 net tons yrly

ARIZONA

A A MNG CO
Box 2258, Globe
Pres: C Allison
MINE, Ashcroft

A B C MNG CO
1220 E Missouri Ave, Phoenix
VERNBELLE, 1-13 MINES,
Yavapai Co, Cu

ALBA MNG CORP
Sanders
MINE, Apache Cy, surface,
benzolite
Mgr: Spencer Balcomb Jr

ALTA URANIUM INC
10th & Grand, Grand Junction
Coie
Pres: R E Dorwart

VP: Tom Casto
Sec: G O Taylor
Treas: G R Simpson
GUANO CARRS MINE, San
Simon, Uyo
Mine Supt: Wm Nelson

ALTUDA MINES, INC
P O Box 1743, Yuma
Pres: Doyle C Gills
Sec-Treas & Gen Mgr:
Harry E Hamilton
ALTUDA MINE, 25 mi SE of Gila
Bend, undergr, open pit Au,
Ag, silica flux
Idle

AMERICAN FIBER CORP
Box 2988, Globe
Pres: A H McRae
VP: Harry Anderson
Treas: R W Roebuck
ROCK HOUSE & CHRYSOTILE
MINES, Gila County, open pit
undergr, asbestos
Gen Mgr: John Tulledge
Gen Supt: John Williamson
Mine Frm: J Peres, W Jenkins
Prod: 150 tons
100-TON MILL, Chrysotile mine
Under devel

**AMERICAN SMELTING &
REFINING CO**
WESTERN MNG DEPT SW DIV
813 Valley National Bldg, Tuc-
son
Mgr: T A Snedden
Asst Mgr: A C Hall
Ch Geol: Kenyon E Richard
HAYDEN PLANT, Hayden, 1200-
ton smelt and conv, Cu
Supt: E E Groff
SW ORE PURCH OFFICE
810 Valley Nat'l Bldg, Tucson
Mgr: Reed F Welch
SILVER BELL MINE, Silver
Bell, surface, Cu
Gen Supt: D R Purvis
Prod: 7,500 tons
MILL, Silver Bell, flt
(See Calif, Colo, Idaho, Ill,
Md, Mont, Nebr, N J, N Mex,
N Y, Tex, Utah, Wash, &
Federal Mng & Smelting Co, Mo)

**AMERICAN ZINC, LEAD
& SMELTING CO**
1515 Paul Brown Bldg,
St Louis, Mo
HILLTOP MINE, Portal, under-
gr, Pb, Zn, Ag, Cu
Idle
(See Ill, Mo, Ohio, Okla, Tenn,
Tex, Wash, Wisc)

AMPET CORP
703 Colorado Bldg, Denver,
Colo
Pres: R A Gus Davis
VP: Robert J Paul
Sec-Treas: Alfred O Brehmer
MINE, Apache County, Uyo
(Leased to K S Mitty)
(See Colo, Utah)

ANDERSON BROS
Earl Anderson, 501 Harmond
Dr, Sunnyslope
MIDNIGHT OWL MINE & MILL,
Li, Sb, Ta, Be, surface,
Yavapai Co
Idle

ANDRADE, FRED
Casa Grande
T & H MINE, 40 mi S Casa
Grande, Mn 2 ton

APEX MINE & DEVEL CO
203 S Bella Vista, Tucson
BENNY & PENNY NO 1, Pima
County, Cu

**ARICANA-SENATOR MNG
CO**
119 Adelaide St, W, Suite 209,
Toronto, Canada
Pres: C A Wuest
SENATOR MINE, 14 mi E of
Prescott, Yavapai Co, undergr,
Au, Ag, Pb, Cu, Zn
300-TON MILL, Construction
suspended
Idle

ARI-VADA DEVEL CO
Box 25, Yucca
McCRACKEN MINE, Mohave
County

ARIVADA MNG CO
Box 119, Wenden
VP-Gen Mgr: Dan Wentworth
Ch Eng: Percy H Ramsden

Met: Rip V Thompson
McCRACKEN MINE, Signal,
Mohave County, undergr, Ag,
Pb
100-TON MILL, Under
construction

ARIZONA ASBESTOS INC
Fay J Hansen, 1018 Title &
Trust Bldg, Phoenix
WALNUT CREEK, TONY MESA
MINES, Gila County, Asbestos

**ARIZONA COPPER
MINES INC**
1404 Milam Bldg,
San Antonio, Texas
DAILY OR CONTROL MINE,
Pima County, Cu

ARIZONA GYPSUM CORP
P O Box 6192, 2365 S 19th Ave,
Phoenix
Pres: John F Fisher
VP, Mine Supt: James M
Champer Jr
Sec, Purch Agt: William J
Kessler
Treas: John M Hasselt
ARIZONA GYPSUM MINE, P O
Box 54, Winkelman, open pit,
gypsum
MILL, crush & screen

ARIZONA MLO CO
Box 1145, Wickenburg
BLACK ROCK MINE, Yavapai
County, Mn

ARIZONA MINE, THE
Box 87, Humbolt
Gen Mgr: Vardin Alexander
ARIZONA MINE, THE, 2 1/2
mi W of Humbolt, Au, Ag, Pb,
Zn
Idle

ARIZONA MINES CONSOL
Box 138, Casa Grande
STELLA MARIS #1, Pinal
County, surface, Mn
Frms: Donald Wenger
(Leased from Don DeSilvia)

**ARIZONA MOHAVE MNG
CO**
Box 338, Kingman
MEXICAN MINE, Mohave
County, Au, Ag

ARNEY CO
E J Stevenson, Box 247,
Agua
VALLEY VIEW & VALLEY
VIEW EXT MINES, Big Horn
Dist, Maricopa County, Mn

B & K MNG CO
Suite 703 1st Natl Bank Bldg,
411 N Central Ave, Phoenix
Pres & Gen Mgr: A M Kalaf
VP: George Kalaf
Sec-Treas: Les Newsum
ATLAS MINE, Box 18, Silver-
bell, 19 mi SW of Red Rock,
undergr, Cu, Zn
Geol: A M Rugg Jr
Mine Frm: Walter Whitlow
125-TON FLOT MILL, 19 mi SW
of Red Rock
Mill Frm: Milton Reeves

BAGDAD COPPER CORP
Bagdad
Pres: J C Lincoln
VP: Frank Snell
Sec: R N Jamison
Treas, Gen Mgr: G W Colville
Purch Agt: Edgar Kellis
Controller: M Thon
BAGDAD MINE, Bagdad, surface
Cu, Mo, Ag
Asst Gen Mgr: R C Bogart
Mech Eng: C W Myers
Geol: R J Bonnis
Met: E S Howell
Elec Eng: W D Deacon
Safety Eng: T L Ferris
Chd Eng: H W Smith
Mine Frm: DS Pike, Van Irwin
Mine Supt: E LeRoy Jones
Prod: 5,000 tons
5,000-TON COPPER FLOT
MILL
Bagdad
Mill Supt: Gaylen Cuesat
Mill Frm: A T Weatherhead,
H P Mullins,
D Van Tilburg
Assayer: D T Holmes

BAKKER, MRS LUCILLE
P O Box 145, Yarnell
CHRISTMAS HOLIDAY MINE,
Waggoner, Au, Ag
Idle

BALD EAGLE GOLD MNG CO

Box 91, Bull Head City
Pres-Gen Mgr: Quincy Crane
MOTHER LORE, THREE
BURROCK GROUP, San Francisco
Mng dist, Mohave County, Au
file

BALESTERO, RICHARD

Ajo
SAN ANTONIO MINE, Pima
County, 950g

BANNER MNG CO

2042 Conner Stravane,
Tucson
Pres: E E Bowman
VP & Gen Mgr: A B Bowman
VP: L L Travis, John M Wallace
Sec-Treas: James E Hagle
Purch Agt: E C Bowman
DARTY & MINERAL HILL MINES
Tucson, undergr, Cu, Ag
Gen Mine Supt: B W Venable
Chf Asst: K A Sisti F C Prince
Mine Supt: Gus Holsworth
Mine Surv: Norman Harvey
Geol: F D MacKenzie
Met Mch: E E Bray
Plan Eng: G E Jackson
Chem: R G Mirenda
Chf Elec: H Hodgson
TWIN BUTTES MINE, Tucson
file
1,000-TON FLOT MILL, Mineral
Hill mine
Supt: Frank Horton
(See N Mex)

BANTA & BEKINS

Nogales
JOE BANTA MINE, Santa Cruz
County, undergr

BEACON EXPLOR CO

Box 293, University Station,
Albuquerque, N Mex
CHIMAYO MINE, P O Box 145,
Winslow, 57 mi S of Winslow in
Stitagraver Nat Forest, undergr,
UyOg, Gumlite, Uranophane,
Pyrrhotite, Pyromorphite
Under devel
REED MINE, P O Box 145,
Winslow, 57 mi S of Winslow in
Stitagraver Forest, Mg
Gen Mgr-Geol: G W Hubbard
Gen Supt-Field Supt-Mill Supt:
Jack Gilstrap
Prod: 8 tons Mg
8-TON GRAY MILL, log washer

BEAR CREEK MINING CO

Box 225, Safford
LONE STAR MINES, 18 mi NE
Safford, Cu
Geol: Ray F Robinson
Proj Eng: Sam Smyth
Under devel
(See N Y; Kennecott Copper Co,
N Y, Utah)

BECHETTI COPPER

CORP
1402 S Main St, Las Vegas,
Nev

Pres: Anton D Bechetti
VP: Arthur Rando
Sec: William Roddie
Treas: George Hansmann
CLIFF & SILVER PLATE MINE,
Box 363, Cottonwood, undergr,
Cu, Au, Ag, Th

BERECROFT, J F

Box 84, Happy Jack
SUNRISE, WOLF HOLE NOS 1 &
2 MINES, Coconino County, Mn

BERRY, C J

Box 42, Wickenburg
B & O WONDER #1 & 2, Yavapai
County, Beryl
file

BEYERLE JR, RUPERT

Panguionia Rd, Nogales
HILL TOP, TRIS DE MAYO
MINES, Santa Cruz County, Mn

BIG HOLE MNG CO

c/o Albert Adams, Box 125
Jerome
UNITED VENDE MINE, Yavapai
County, open pit, Cu

BLACK DIAMOND

Yuma City
BLACK DIAMOND, Yuma City,
surface & undergr, Mn
Supt: Lewis Smith, Blyth, Calif

BLACK QUEEN MNG CO

800 N Central Ave, Phoenix
MINE, Mn

BLUE BONNET MINERALS

INC
Box 143, Globe
IRON HIVE & VACY CONSTANCE
MINES, Gila County, Mn

BLUE JESTER MINES,

INC
519 W Francis, Tempe
BLACK JACK MINE, Pima
County, undergr, Mn
Gen Mgr: Russell Wright
Frm: Owen Wade
Prod: 10 tons

WALTER BOFF MINING

CO
43 S 9th Ave, Tucson
Gen Supt: L Jarnagin
SILVER LORE, 14 mi W Amado,
undergr, Ag

BORDER MNG CO

Hereford
POWER CLMS, Cochise County,
Mn

BORE-TREE SADDLE

MNG CO
Globe
Mgr: C L Moore
GOLDEN COCK MINE, Gila
County, Asbestos

BOSLICH, TOM

Sanflowen
WARD CLAIMS, Maricopa
County, Mg
(Onida Mng Co)

BOULDER MNG CO

Box 5, Patagonia
BLACK DIAMOND MINE,
Santa Cruz County, open cut, Mn

BRACKEN MNG CO

Box 111, Agula
BRO NEGRO (BLACK BEAR)
MINE, undergr, Mn
Gen Mgr: R J Brachon
Prod: 10 tons

BROSHEARS, HAROLD

808 W Green, Gallup, N Mex
MINE, UyOg

BROWN, FLOYD

Box 46, Wenden
BLACK DIAMOND MINE,
AMERICAN CLMS, Mohave
County, Mn

BROWN & ROBINETT

Box 46, Wenden
BLACK DIAMOND, PRICE,
PRICELESS MINES, Mohave
County, Mn

BRUCE MINING CO

617 3rd St, Safford
BRUCE MINE, Graham County,
Cu

BUCKEYE MICA CO

Box 416, Buckeye
Pres & Gen Mgr: H G Smith Sr
VP: H G Smith Jr
Sec: W Peabocke
BUCKEYE GROUP, 3 1/2 mi S
of Buckeye, undergr, Mica
(Muscovite), Sericite, Bz,
Feldspar
Supt: A Duncan
Asst Supt: C Murphy
Frm: C V Hill
Prod: 100 tons
LUCKY CHANCE 1-2-3, 5 mi W
of Quartzsite, Sericite
Prod: 25 tons
Under devel

100-TON DRY & WET GRINDING

MILL
Supt: J G Smith Jr
Frm: Wayne Watts

DUELL, A R

Wickenburg
SUBIE Q, WISCONSIN CLMS,
Maricopa County, Mn

BUNDY, C M

Mt Trumbull
RED WING MINE, open pit,
UyOg
Under devel

CABINET INVESTMENT

CO
c/o R J Johnstone, Apt 4,
Dominion Hotel, Globe
MINE & MILL, Sierra Ancha,
Gila County, Mn

CADMIN INVESTMENT CO

1508 N 15th Ave, Phoenix
SUNSET GRP, Gila County, Mn

CALARI MNG CO

3930 Linden, Long Beach 7,
Calif
Pres & Gen Mgr: L F Albrecht
Sec-Treas: C M Smith
RUTH MINE, Box 941, Prescott,
8 mi S of Prescott, undergr, Zn
Pb, Cu, Ag, Au
Under devel

CAMERON MNG CO

Cameron
Pres: N Steinberger
Mgr: Page Blahomere
EMMET LEE, JUAN HORSE
MINES, Cameron Dist, Coconino
County, UyOg

CAPITOL-SEABOARD

CORP
103 E La Plaza, Farmington,
N Mex
Pres: Joseph H Corbin
Exec VP & Gen Mgr: Chas W Yetter

Sec: Wm A Pope, Jr

Treas: Howard L Corbin
SIMPSON #1 MINE, Apache
County, undergr, UyOg, V2Og
Prod: 15 tons
(See Idaho, Mont, N Mex, Tex,
Utah)

CAREY, BOORSTIN,

OLSON
112 Republic Bank Bldg,
Dallas, Tex
JOHN TODEA MINE, Coconino
County, UyOg

WM J CAREY MNG CO

824 Road Ave, Grand Junction,
Kala
MINE, Navajo Indian Reservation,
Navajo County
Explor
(See Colo)

CENTURY MOLYBDENUM

COPPER CO
55 N Matlock St, Mesa
Pres: Arnold H Johnson
VP: Paul N Johnson
Sec-Treas: Henier U Johnson
Purch Agt: A H Johnson
RARE METALS MOLY, BLACK
COPPER MINES, 8 mi S of Ray,
undergr, Mo, Cu, As, Ag
Mine Supt, Gen Mgr: A H Johnson
Asst Gen Mgr: Paul N Johnson

CHARLESTON MINES, INC

Box 357, Tombstone
Pres & Gen Mgr: Chas H Sutter
CHARLESTON LEAD MINE, 1
mi SW of Tombstone, open pit,
sericite, An, Pb, Cu
Prod: 48 tons
WASHING PLANT, at mine

CHARTER MNG CORP

615 Simms Bldg, Albuquerque,
N Mex
TWO MNO CLMS, Coconino
County, Mn

CHILITO MINE GROUP

Box 1064, Hayden
Own: B C Velasco
CHILITO MINE GRP, Gila
County, open pit, Cu, Silica
Prod: 50 tons
(Leased to Gordon Wainwright)

CHRISTOFFERSON, HANS

Box 80, Agula
MINE, undergr, Mn

CLARK, FRANK

Box 334, Bowie
SILVER STRIKE MINE, 15 mi S
Bowie, undergr, Pb, Zn, Au, Ag
Under devel

TUPATEX MINE, 14 mi N Bowie,

surface, tufatex

CLARK, JOE

Rt 1, Box 42, Globe
BIG IRON NO 4, KENO MINES,
Gila County, Mn

CLIMAX URANIUM CO

(SUBSID AMERICAN METAL
CLIMAX INC)
Box 1901, Grand Junction, Colo
VP & Gen Mgr: A M Mastrovich
URANIUM EXPLOR & PROD,
Navajo Indian Reservation
(See Colo, N Y, Utah)

COBRE GRANDE MNG CO

Box 235, Safford
Gen Mgr: Tom Beard
COBRE GRANDE MINE, Graham,
Co, Cu

COLBURN, E A JR

Box 153, Wickenburg
CONGRESS MINE, 3 mi N of
Congress Jr, undergr, Au, Ag,
W2O, UyOg
Under devel
(Leased to Japays Mng Co,
Phoenix)

CONSOLIDATED

MINERALS
1200 E Glendale, Glendale
MINE, Pegmatites

B W COPELAND MINES

311 S Montezuma St, Prescott
Own: B W Copeland
C & A MICA & FAIRY TALE
MINES, West Yavapai County, Cu,
Ag, Au
Under devel

COPPER ACE MNG CO

Box 167, Yarnell
Own: B M Ramsey
STRIP & OPEN CUT DEVEL, 8
mi S of Kirkland Jet, Cu

COPPER BUTTE MNG CO

Box 688, Ray
COPPER BUTTE, Pinal County,
Cu

COPPER CREEK MINES

INC
505 Title & Trust Bldg,
Phoenix
CHILDS, ALDWINDE CLMS,
Pinal County, Cu

COPPER HILL SILICA

Globe
COPPER HILL SILICA PIT,
Gila County, surface, Cu, Si
Mgr: E M Moores

CORONADO COPPER & ZINC CO

523 W 6th St, Los Angeles 14,
Calif
JOHNSON CAMP UNIT, Cochise
County, Pb, Zn
(See Calif)

COVERED WELLS

COPPER CO
4353 E Elmwood, Tucson
Sec-Treas: Milton F Graf
ST PAT COPPER MINE, Pima
County, Cu

COVEY, W E & ASSOC

829 S 6th St, Las Vegas, Nev
GRAND GULCH MINE, Mohave
County, Cu

CRESCENT MNG CO

Box 347, Mammoth
CRESCENT MINE, Pinal County,
surface, Mn

CYPRUS MINES CORP

523 W 6th St, Los Angeles 14,
Calif
OLD DICK MINE, Box 548,
Bagdad, undergr, Zn, Cu
Res Mgr: Curtis Sandeen
Mine Supt: D F Turberville
Geol: Keith Coke
Mech Eng: Herbert Dahmton
Chf Ck: W Nelson
Mine Frm: Joseph Sternakoski
Prod: 250 tons
Under devel

250-TON FLOT MILL, Bagdad

Mill Supt: L Yundt
Assay: H Bollweg
(See Calif, Colo)

DANIEL, JESUS

Box 91, Blythe, Calif
METATE NO 3, CONFUSION
No 1, Yuma County, Mn

DASCO MINES CORP

Box 87, Wenden
DOYLE MINE, Yuma County,
Mn

DE SILVA, DON

515 E Willetta St, Phoenix
STELLA MARIS #1 MINE, Pinal
County, surface, Mn
(Leased to Aris Mines Consol)

DIXIE QUEENE MINES

INC
c/o Phillips Motors Inc, 323
N 2nd St, Phoenix
DIXIE QUEENE MINE, Yavapai
County, Pegmatites

DUVAL SULPHUR & POTASH CO

17th Flr, Mellie Esperson
Bldg, Houston 2, Texas
Pres: W P Morris
VP: G E Atwood
VP & Treas: Eugene German
Sec: V J Thornhill
COPPER DIVISION-ESPERANZA
MINE, Box 1277, Tucson 2,
open pit, Cu, Mo
Res Mgr: G E Atwood
Asst Res Mgr: H G Messer
Geol: D M Clappinger
Metall: C H Curtis
Mine Eng: Tom Janic
Mech Supt: H A London
Under devel
10,000-TON FLOT MILL, at
mine
Mill Supt: B Phillips
(See N Mex, Texas)

EL JAKARTA MNG CO

Box 42, Tumacacori
Pres, Own & Gen Mgr:
D D Burcher
VP & Purch Agt: H W Bailey
Sec: A C Burcher
Treas: D D Burcher, Jr
A-B MINE, Josephine Canyon,
undergr, Cu, Pb, Au, Ag
Asst Gen Mgr: H W Bailey
Gen Mine Supt: D D Burcher Jr
Gen Mgr & Mine Eng:
D D Burcher

EVANS, P T

Agula
BLACK BART, DESERT ROSE,
LUCKY CLAIM MINES,
Maricopa, Mn

FLINTKOTE CO, THE

U S LINE PRODUCTS DIV
Box 156, Peach Springs
ARIZONA QUARRY, open pit
Supt: James Curfies
(See Calif, Nev, Tex)

FORTUNE MNG CO

Box 786, Nogales
ALTO, VICTOR MINES, Santa
Cruz County, Pb, Zn

GENERAL MNG CORP

8711 Sunset Blvd, Los
Angeles, Calif
Pres: E J Speake
VP: Dan Carly
Sec: Allan Thody
Treas: Howard Mallring
MINE, Yuma County, undergr,
MnProd: 20 tons
(Leased to McFarland, Hullinger,
Lovelie, Utah)

GIACOMA BROS MNG CO

P O Box 547, Tombstone
DEFIANCE MINE, Cochise
County, Pb, Zn

GIBALTAR MINERALS

CO
P O Box 35067, Dallas 35, Tex
Pres: Harold Hinn
VP: Robert Hinn
Treas: Vincent Tudor
BOOT JACK MINE, P O Box 38,
Kayenta, undergr, UyOg
Prod: 100 tons

GIBALTAR URANIUM & OIL CO

Grand Junction, Kala
Pres: I W Andrews Jr
ROUGH ROCK #1, Navajo Reser-
vation, Chinle, undergr, UyOg,
V
Gen Mgr: James J Geddes
Geol: Joe Bowman
Supt: James Martin
Prod: 30 tons

GODFREY BROS:

RAYMOND & GRANT,
LESSEES
Box 553, San Manuel
BLACK BEAUTY MINES, Old
Hill mng dist, Pinal County, Mg,
open pit
Own: Wm Ward, Box 603,
Tombstone
Gen Mgr: Raymond Godfrey
Prod: 60 to 80 tons per mo
30-TON JIG MILL, at mine
Mill Supt: Grant Godfrey

GORTZ, CHARLES E MNG

& EXPLOR CO
Box 2278, Phoenix
Pres-Sec-Treas: Charles E
Gortz
79-MINE, Box 1, Winkelman,

open pit, undergr., Pb, Cu, Zn, Au, Ag
 Mine Frms: Herman C Orlason
 Under devel
 50-TON GRAV-FLOT Mill, at mine

GOLCONDA CHEM CORP
 Box 1190, Kingman
 Pres: Howard H Neilman
 TUB, PROSPERITY, BLACK-
 FOOT & GOLCONDA MINES,
 Wallapai Mng Dist, undergr.,
 Zn, Au, Ag, Pb
 Under devel

GOLD BASIN PLACERS
 c/o Joe Jackson, Box 9,
 Quartzsite
 PLACERS, Yuma County, Ariz

GREENE, FRANK
 3711 E Elm Dr, Phoenix
 BLACK DIAMOND, M & A,
 Yuma County, Mn

GRIMES & BRUNSON
 Tonks Basin
 Part: W A Brunson, GK Grimes
 GOLD CREEK MERCURY MINE,
 25 mi S of Payson on Beeline Hwy
 open pit
 Prod: 30 flasks
 GRAV-MILL at mine site
 McQUEE MINE, RATTLESNAKE
 MILL, Gila County, Hg

HAWKEYE MNG & DEV CO
 Box 1231, Winslow
 HAWKEYE, PATRICK, LAST
 CHANCE, PHILOMELANE,
 BEAR CLAW MINES, Coconino
 County, Mn

HAYNES, G R
 Box 1041, Globe
 OLD REGAL OPEN PIT, 50 mi
 N Salt Riv hwy, asbestos
 Prod: 1 1/2 ton

HEATH, EARL
 Box 38, Yuma
 LAST CHANCE MINE,
 Hualapai Mts, undergr.
 CONGRESS MINE, Mohave
 County, undergr.
 LOST MILL MINE, Ariz cedar,
 undergr., Au Ag Pb Cu
 LITTLE DEEPER, Valley mng
 dist, Ag, Pb
 UNCLE JIM, Co, Ag, Pb,
 undergr.
 Idle

HEATHER, HARRY F
 236 S Oak Knoll Ave,
 Pasadena, Calif
 SPEC-BOMA MINE, Oatman, Ariz
 WHITE HOUSE MINE, Oatman,
 Brucite, MgO
 Idle

HENCO MNG CO
 2202 W Van Buren, Tolleson
 SNOWFLAKES NO 6 & 8 MINES,
 Mohave County, Mn

HILLSIDE MNG & MLG CO
 Hagad
 HILLSIDE MINE, Yavapai
 County, Pb, Zn

HILTON, E P
 Box 1308, Tucson
 STATE OF MAINE & LONEMTN
 MINES, undergr., Pb, Ag, Au
 Idle

HOLKEN MNG CO
 Box 308, Winterhaven, Calif
 MILL TLOS & CLEANUP MINES,
 Mn

HOOPES & CO
 Globe
 Mgr: K L Hoopes
 MINE, MILL in Gila County,
 limestone

HOTT, PHILIPS & SON
 P O Box 2040, Phoenix
 Own: Philip S Hoyt Sr &
 Philip S Hoyt Jr
 MICA MINES, Mohave, Maricopa,
 Yuma County, undergr & surface,
 Mica, Rare Earths, Beryl
 Under devel

**H & R TRANSFER &
 STORAGE**
 411 S 1st St, Phoenix
 FRENCH LILLY, MILL
 CLEANUP MINES, Yavapai
 County, Ariz

HUALPAI MNG CO
 Kingman
 LAGUNA GRP, Coconino County,
 Cu

HUFFMAN, HENRY
 300 Chrysocolla, Globe
 SAMSSEL GROUP, 18 mi SW
 Globe, Cu, Ba, Pb
 10-TON FLOT MILL at mine
 under devel

**INDUSTRIAL URANIUM
 CO**

Phoenix
 Mgr: Bill Doolin
 NATIONAL MINE, Maricopa
 County, Hg, SUNLIGHT &
 STARLIGHT MINES, Navajo
 County, UOg

**INSPIRATION CONS
 COPPER CO**
 25 Broadway, New York 4, N Y
 Pres: P D Honeyman
 Exec VP: H M Jacob

Sec-Treas: E F Wendt
 Dir of Purch: A B Harris
 INSPIRATION MINE, Inspiration,
 surface Cu
 Gen Mgr: H C Weed
 Asst Gen Mgr-Asst Sec-Asst
 Treas: C G Stunt
 Plant Supt: C B Kettering
 Geol: E F Reed
 Mech Eng: A H Neal
 Elec Eng: Mark Smith
 Auditor: E M Bredwell
 Purch Agt: K W Whiteaker
 Power Plant Supt: T E Tizard
 Mine Supt: J R Watts
 Asst Mine Supt: T E Bilson
 Gen Pit Frm: T M Anderson
 Ch Mine Eng: J L Carne

LEACHING PLANT & CONCENTRATOR, Inspiration
 Leaching Plant Supt: W D
 Schrader
 Ch Research Eng: A J Turk
 Acid Plant Frm: J C Davies
 Concentrator Supt: K L Power
 Concentrator Frm: A L Welch
 CHRISTMAS MINE, Christmas,
 undergr., Cu
 Gen Supt: B B Whitney
 Supt: N G Thompson
 Gen Mine Frm: H R Flais
 Geol: J T Eastlick
 (See N Y)

**INTERNATIONAL
 MINERALS & CHEM CORP**
 CONS FIELDSPAR DEPT
 Old Orchard Road, Shohie, Ill
 VP: Norman J Dunbeck
 Gen Mgr: James E Castle
 Mgr: E W Koenig
 Prod Mgr: Phil Blazovic Jr
 Sales Mgr: W K Burris
 FIELDSPAR MINE, Box 229,
 Kingman, surface
 Supt: J W Allen
 150-TON MILL, Kingman, fine
 grinding
 Supt: J W Allen
 (See Colo, Fla, Ill, Maine, Miss,
 N C, N Mex, S D, Tenn, Va, Wyo)

**INTERNATIONAL MINES
 INC**
 6708 E Cooper, Tucson
 COPPER PLATE 1 & 2, Pima
 County, Au, Ag

**INTERNATL SMELTING &
 REFINING CO**
 Miami
 3,000-TON CUSTOM SMELTER,
 Inspiration
 Supt: Harold Ford
 Ore Buyer: Clifton F Smith
 (See Utah)

**INTERSTATE OIL &
 DEVEL CO**
 P O Box 1234, Wickenburg
 Gen Mgr: Versar Allen
 Supt: Joe Allen
 ANDERSON MINE, Ocho Como
 Dist, Yavapai County, surface,
 UOg
 Idle

IRON HAT MNG CO INC
 Box 347, Globe
 NEW DOUGHOBY SHAFT, Gila
 County, Mn

IRON TREE MNG CO
 1718 Chester Ave, Bakersfield,
 Calif
 Mgr: Albert Smith
 Supt: Elmer Glenn
 LITTLE BUTTE MINE, 5 mi N
 of Bouse, Mohave County,
 surface, Au
 50-TON CYANIDE PLANT

ISBELL CONST CO
 Box 1710, Phoenix
 ESPERANZA COPPER MINE,
 Tucson, contract mng for Duval
 Sulphur & Potash Co
 Supt: John Wright
 (See Idaho, Nev, Utah, Wash)

JACKSON, OTT
 Congress
 OCTAVE PLACERS, Yavapai
 County, Au
 Idle

JACKSON, WILLIAM E
 Box 24, Payson
 GOLD HILLS MINES, Gila
 County, Cu
 RED ANT MINE, Gila County,
 Au, Ag

JACOBS LAKE MNG CO
 Box 132, Mifflin, Wisc
 PETOSKEY GROUP, Coconino,
 Co, Cu

JAQUAYS MNG CORP
 1219 S 10th Ave, Phoenix
 Pres & Gen Mgr: D W Jaquays
 VP: G A Jaquays
 Sec-Treas: Ethelyn Jaquays
 Asst Gen Mgr: Alvin Gerhardt
 Gen Supt: Leroy Wood
 REGAL & CANADIAN MINES,
 Box 326, Globe, 47 mi N of
 Globe, undergr, asbestos
 Gen Mgr: Alvin Gerhardt
 Asst Gen Mgr: Leroy Wood
 Gen Supt-Mine Supt: John Kilner
 Prod: 150 tons rock, 15 tons
 asbestos mill ore
 20-TON GRAV MILL, Globe
 Mill Supt: W Meyers

JOLYN ASSOCIATES
 Box 1106, Wickenburg
 GLOBE MANGANESE, WEST
 MINES, Gila County, Mn

**K B R MNG & DEVEL CORP
 INC**
 Box 186, Yarnell
 Pres & Purch Agt: Jerold P
 Kolar

VP: Claude Brittain
 Treas: E Kolar
 STAR OF ARIZONA, ELSIE'S
 JACK POT #1 & #2 MINES, Kolar
 Group, undergr, Au, Ag, Cu, Pb
 Gen Mgr: J P Kolar
 Idle

**KENNECOTT COPPER
 CORP, RAY MINES DIV**
 Ray

Gen Mgr: A P Morris
 Asst Gen Mgr: H J O'Carroll
 Compt: C R Knous
 Purch Agt: N E Guyer
 Adm Asst: C L Hoyt
 Safety Eng: R A Willoughby
 Ind Eng: J M Hood
 RAY MINES, open pit Cu, Ag
 Gen Mine Supt: J C Van
 DeWater

Prod Supt: R W Ballmer
 Geol: J Wertz
 Asst Pit Supt: R W Ballmer
 Ind Rel Dir: J E Peterson
 Quality Cont Dir: J L Stevens
 Maint Supt: A L Dickerson
 Pit Frm: C W Taylor
 Ch Eng: H W Bishop
 Prod: 15,500 tons
 15,500-TON FLOT MILL, Hayden,
 23 mi SE of Ray
 Mine Supt: A T Shabas
 Reduction Supt: F G Woodruff
 Maint Supt: J E Stocker
 Power Plant Eng: T L Hillman
 Plant Eng: J A Cooper
 SMELTER, Hayden
 Supt: W H Winn
 Under cont
 (See Nev, N Mex, N Y, Utah)

KERN COUNTY LAND CO
 2624 N 1st Ave, Tucson
 Mgr: Minerals Dept:
 Wm T Grawmnd
 Ch Minerals Geol: Wayne K
 Walker
 (See Calif, Idaho, Utah)

**KERR - MCGEE OIL
 INDUST, INC**
 RAVAKAT
 BRAKAMH DIV
 Box 608, Shiprock, N Mex

COVE MINE, Cove, undergr,
 UOg, YUg
 Gen Mgr: M F Bolton
 Geol: Billy Stevens
 Mine Supt: Jack Landon
 Mine Frm: Vernon Willden

Prod: 200 tons
 MILL, Shiprock, N Mex
 500-TON MILL, Shiprock
 Supt: Dick Shreve
 (See Colo, N Mex, Okla, Wyo)

KIMBLE, THOMAS
 1310 Silver City Heights,
 Silver City, N Mex
 GLOBE MANGANESE, STALLO
 & MOODY MINES, Gila County,
 Mn

KING MIDAS MINES, INC
 P O Box 419, Oatman
 Pres-Gen Mgr: James H
 McCarthy

GOLD KEY & IDA MINES
 Oatman Dist, Mohave County,
 Au, Ag
 Idle

KLANER & ASSOC
 227 E Coronado Rd, Santa Fe,
 N Mex

BOYD TSI MINE, Cameron
 Ariz, open pit, UOg
 Gen Mgr-Mine Supt: M W
 Follick
 Idle
 (See N Mex)

KLOSSET, CHRISTIAN
 Sells Star Rt, Box 25, 314 E
 Aviation Hwy, Tucson
 SUNSHINE GRP, Pima County,
 Pb, Zn
 BANNER MINE, Pima County,
 Cu

**KNOX - ARIZONA
 COPPER MNG CORP**
 4067 Lashar Rd, St Louis 24,
 Mo

Pres: Wm A Knox
 VP: Tom Keyes
 Sec-Treas: Wm A Knox
 COPPER MT MINE, Ajo
 Under devel

KOFA QUEEN MNG CO
 Box 1782, Yuma
 EVENING STAR, QUEER BEE
 MINES, Yuma County, Mn

**KYLE ASBESTOS MINES
 OF ARIZ**
 Box 302, Globe
 SLOAN CREEK, LUCKY STRIKE
 MINES
 Op: Roger Q Kyle

L A MINING CO
 507 E Willetta St, Phoenix
 MORNING STAR NO 1, Yavapai
 County, Mn

LAW, RALPH
 Aguila
 BLACK BART NO 1 LUCKY
 NO 1 MINES, Mn

LEON, MILTON
 206 Wright Bldg, Tulsa 3,
 Okla
 UNCLE SAM MINE, Box 859,
 Nogales, 5 mi NE of Nogales,
 undergr, Au, Ag, Pb
 Under devel

LEROW MINE
 Cochise County
 MINE, Cochise County, undergr
 & surface, Pb, Ag
 Own: Thomas P Bean, Box 5
 Dos Cabezon
 Idle

**LETOURNEAU ASBESTOS
 CORP**
 c/o Sol Hales, 1-39-27th St,
 Fairlawn
 LETOURNEAU MINE, Gila
 County, Asbestos

LEWISOHN COPPER CORP
 P O Box 2278, Tucson
 Pres: Richard E Chilson
 VP: Boyd M Morse

**PEACH MINE, Helvetic, 35 mi
 SE of Tucson in Santa Rita Mts**
 open pit, Cu
 Under devel
KING EXILE MINE, Helvetic,
 undergr, Cu

LIGIER, TOM
 Dragon
 BURRITO DE PIERRO MINE,
 near Dragon, Cochise County,
 Pb, Ag

LUCKY STOP MNG CO
 Young Rt, Globe
 Partnership: Johnnie Brunson
 William Brunson

Ed Conway
 Hugh Nichols
 LUCKY STOP MINE, Gila
 County, undergr, UOg
 Mgr & Mine Supt: Johnnie
 Brunson
 Under devel

**P H LUND ENGINEERING
 CO**

3411 N 14th Place, Phoenix
 Pres: Guy J Stumpf
 VP: Emmet R Feighner
 Sec-Treas: P H Lund
 LUCKY HORSE SHOE GROUP,
 Gila County, open pit
 Gen Mgr: Guy J Stumpf
 Mine Eng & Geol: P H Lund

MAGMA COPPER CO

Box 37, Superior
 Pres & Gen Mgr: W P Goss
 Asst Gen Mgr: J F Buchanan
 VP & Sec: Ray Bonobras
 Treas: W P Schmidt
 Parch Agt: Ray Medlock
 MAGMA MINE, Superior,
 undergr, Cu, Au, Ag
 Gen Mgr: Darrell Gardner
 Gen Supt: G L Augustadt
 Geol: R N Webster
 Mine Supt: Cecil Tomerlin
 Asst Mine Supt: H S Steel
 Mine Eng: B Van Voorhis
 Prod: 1,500 tons
 1,500-TON FLOT MILL,
 Superior
 Supt: Halder Rex
 Frms: M C Cook
 Assay: Martin Harris
 REVERED SMELTER, Superior
 Supt: E J Caldwell
 Asst Supt: C L Soule
 Prod: 48,000, 600 lbs the yrl

**MARCY-SHENANDOAH
 CORP**

Jarvis Bldg, Durango
 Pres & Gen Mgr: S Stokes
 Tomlin Jr
 VP & Geol: E M Darge
 Sec: R M Schell
 Treas: Robert R Snodgrass
 JACK DANIELS MINE, Cameron,
 open pit UOg
 Idle
 (See Colo, Utah)

MARSTELLER, GROVER

Nogales
 Op: Alfredo Valenzuela, 120
 Page St, Nogales
 MINE PRIETA MINE, Santa
 Cruz County, open cut, Mn

MASSINGILL, C E
 2063 W 1st St, Mesa
 MINE, Spring Creek Dist, Gila
 County, Barite
 Under devel

MASTER MNG CO
 Box 68, Yarnell
 Supt: J M McIntosh
 LUCKY ALICE CLMS, Walnut
 Grove Dist, Yavapai County,
 1 1/2 mi N of Walnut Grove on
 Haasayampa Riv, placer, Au

MAZONA MINERALS INC
 132 Frontier St, Wickenburg
 Pres: O Calvin Williamsen
 VP: Proctor G Milliken
 SHANNON MINE, undergr &
 surface, Mn
 Gen Mgr: Proctor G Milliken
 Gen Supt: Carl Allebrand
 Assayor: Joseph Girard
 Mine Frm: Ralph Henderson
 Prod: 1000 tons
 1000-TON FLOT & GRAV MILL,
 Artillery Peaks
 Mill Supt: Carl Allebrand
 Assayor: Joseph Girard

MCCARRELL & OURLY
 C H McCarrrell, Chambers
 CHETO MINE, Bentsville, pit,
 Apache County

MCELRAITH, FRANK
 Rt 6, Box 9, Tucson
 PROSPERITY, BLUE COPPER
 MINES, Pinal County, Cu

**MCFARLAND &
 HULLINGER**
 915 N Main St, Box 338
 Tooele, Utah
 Own: F O McFarland &
 S R Hullinger

**SAN XAVIER MINE, Box 811,
 Tucson, undergr, Pb, Zn, Cu**
 Gen Supt: Wilmer D Nelson

Geol & Mine Engt: Gerald W. Irwin
Prod: 10 tons
400-TON MILL, Sahuarita
 Supt: R. L. Erickson
 (See Utah)

MCLEOD & MILLER
 Mayor
BURMESTER MINE, Yavapai
 County, surface, Mo

MCNEEL, NOEL
 Chambers Store, Roy
STEAMBOAT, STEAMBOAT
APPROACH, LUCKY STAR
 MINES, Pinal County, Mo

METATE ASBESTOS
CORP
 Box 11, Globe
 Pres, Gen Mgr & Purch Agt:
 Jack L. Neal
 Asst Gen Mgr & Sec:
 Chas. Ross Neal

TRIPLETS MINE, Apache
 Reservation, Graham County,
 Mo
LUCKY SEVEN MINES, San
 Carlos Apache Indian Reser-
 vation, undergr, asbestos
 Asst Supt: Harvey Collins
 Prod: 18 tons

MIAMI COPPER CO
(COPPER CITIES DIV)
 81 Broadway, New York 6,
 NY

Pres: E. H. Westlake
 VP: J. H. Willits
 Sec-Treas: John Greenburgh
MIAMI COPPER COMPANY,
 Box 108, Miami, undergr, Cu
 VP & Gen Mgr: B. R. Coll
 Asst Gen Mgr: J. H. Gray
 Gen Supt: C. C. Webb
 Geol: W. W. Simmons
 Mech Supt: R. P. Hughes
 Met: J. J. Bean
 Elec Engt: A. T. Hottelblad
 Mine Supt: E. G. Williams
 Asst Mine Supt: W. F. Stonn
 Mine Eng: J. S. Fletcher
 Prod: 8,500 tons
17,000-TON MILL, Miami
 Mill Supt: R. L. Mountjoy
 Assayer: G. R. Warren
 (See NY)

MIDWEST RESOURCES
 1505 N 15th Ave, Phoenix
 Pres-Gen Mgr: Wayne Johnson
MINE, Omine Dist, Mohave
 County, 4 mi S of Wickenburg, Mo,
 Pb
50-TON JIG PLANT
 Idle

MINERALS CORP OF
AMERICA
 c/o Vickers Bros, 39 Wall St,
 New York, NY
YUMA COPPER MINE, Yuma
 County, Cu

MINES CONTRACTING CO
 c/o De Kuslito, Wickenburg
BLACK DIAMOND MINE,
 Mohave County, Mo

MINEX DEVELOPMENT
CO
 Box 20, Patagonia
 Own: Morris Delgoblah
 Orville Rigby
TIA JUANA MINE, 13 mi E of
Amado, Santa Cruz County,
Co, Pb, Au, Ag
 Under devel

MOHAVE MNG & MFG CO
 Box 65, Wickenburg
 Pres: H. F. Lynn
 VP: G. S. Borden
 Sec & Treas: Frank Kohler
 Purch Agt: Rudy Kawahik
 Mgr: W. R. Easley
BOX GARDEN MINE, near Wicken-
burg, open pit, Mn
 (Mining by contract)
 Gen Mgr: W. R. Easley
 Geol: L. E. Whitney
 Met: T. Saunders
 Prod: 100 tons
350-TON FLOT & HEAVY-MED
MILL, tables, Box Canyon,
Yavapai County
 Mill Supt: Geo. Johnson
 Assayer: Lyle Schwader
SINTERING PLANT, Yavapai
County
BLACK ROCK MINE, Maricopa
 County, open pit, Mn
 Prod: 100 tons

MOORES, CHARLES F
 Box 481, Globe
LAST CHANCE MINE, Pinal
 County, Pb, Zn
MONITOR GROUP, Pinal County,
Au, Ag

NASH MINES
 408 Nash Bldg, Austin, Tex
 Own: Joe P. Nash
BONANZA, HOLLAND, KANNAH,
ESTELLA, BELMONT, MAINE,
NEW YORK, INDIANA,
DUQUENNE, & EMPHRE MINES,
 Patagonia mng dist
 Gen Mgr: D. G. Gilbert

NASH & MCFARLAND
 408 Nash Bldg, Austin, Tex
FLUX MINE, Patagonia, under-
gr, Pb, Zn, Ag
 Gen Mgr: E. W. McFarland
500-TON TRENCH MILL,
 at mine

NAVAJO TRIBE
 Box 140, Window Rock
 Chmn: Paul Jones
MINES, undergr & surface,
UgO

NORGAARD, IHAR
 P O Box 394, Kailogg, Idaho
 P O Box 71, Mexican Hat,
 Utah
MINE, UgO

OLD GOLD MNG CO
 Box 284, Selma
 Own & Op: Maurice Hedderman
ALLISON MINE, Selma, under-
gr, Au, Ag, Ag
 Prod: 10 tons

ONEIDA MINING CORP
 -1004 Farmer Ave, Tempe
 Pres: Thomas E. Bolich
 VP: Allison A. Durey
 Sec: Chauncey A. Brion
ONEIDA MINE, 30 mi S Payson,
 Surface, Hg
 Gen Mgr: Thomas E. Bolich
 Met: Chauncey A. Brion
 Prod: 40 tons
40-TON FLOT MILL, at mine
 Supt: Chauncey A. Brion
4-FLASK RETORT REFINERY,
 at mine
 Supt: Chauncey A. Brion

ORO FINO MINES, INC
 Box 107, Prescott
 Pres: Maurice O. Maynard
 VP & Gen Mgr: W. O. Hall
SILVER CROWN MINE, 8 mi E
of Kirkland, undergr, Pb, Ag,
Au, Cu
 Mine Supt: Sam A. Koster
 Asst Mine Supt: L. E. Bigelow
50-TON MILL, on Wagon Rd
3 mi from mine
 Supt: Ralph Fairchild
 Asst Supt: A. J. Buhaker
CATACTIN MINE, 12 mi SW of
Prescott, undergr, Ag, Pb, Au,
Zn, Cu
 Idle

PAN AM MNG CO
 Box 7143, Globe
BETTY NO. 1, STARLIGHT
GROUP, Graham County, Cu

PATTERSON, C C
 Box 174, Chloride
CHAMPION MINE, Mohave
 County, Pb, Zn
DOWNIE LEASE, EMERALD
ISLE MINE, Mohave County, Co,
Pb, Zn

PATTERSON, C C
 Box 174, Chloride
CHAMPION MINE, Mohave
 County, Pb, Zn
DOWNIE LEASE, EMERALD
ISLE MINE, Mohave County, Cu

PAUL LIME PLANT
 Paul Spur
 Pres & Gen Mgr: Alfred Paul Jr
 VP: Virginia Holland Paul
 Sec-Treas & Asst Gen Mgr:
 Howard E. Ames Jr
MINE, open pit, lime rock
 Supt: C. T. Bishop
 Mech Eng: Rafael Sepulveda
 Prod: 800 tons
LIME KILN, rotary kiln,
 crushing & grinding & screening
 plant

PELAN, DAVE
 328 N 9th St, Grand Jct, Colo
UgO

PERLITE INDUSTRIES OF
ARIZONA

2125 E. Henshaw Rd, Phoenix
 Pres: Lewis Williams
 VP: Reagan Williams
 Sec-Treas: Buster Williams
ADAMS MINE, Superior, open
pit, perlite
 Gen Mgr: Buster Williams
 Supt: Harley Miller
 Prod: 50 tons
MILL, Superior, crushing
 Supt: Harley Miller

PERRY, RAYMOND
 Rt 1, Box 27, Salome
BLACK BEAUTY MINE & MILL,
 Yuma County, Mo

PETTIGREW & DAVIS
 Dove Creek, Colo
UgO Prod

PHILLIPS ASBESTOS
MINE
 Globe
 Mgr: Guy Phillips
MINE, Gila County, surface,
 undergr, asbestos
 MILL

PHELPS DODGE CORP
WESTERN OPERATIONS

Douglas
WESTERN OFFICES
 VPS Gen Mgr, Western
 Oper: W. C. Lawson
 Asst Gen Mgr: J. B. Pullen
 Asst to Gen Mgr: W. E. Penz
 Office Mgr: H. E. Moore
 Dir, Labor Rel: W. J. Uren
 Ch Mech Eng: J. H. Davis, Jr
 Geophysics Research: E. E. Maillet
 Gen Aud: G. A. Swanson
 Asst Gen Purch Agt: K. A. Ables
 West Traffic Agt: A. C. Bacon
MORENCI BRANCH, Morenci,
 open pit mines, Cu, Au, Ag, Mo,
 concentrator & Smelter
 Mgr: L. M. Barker
 Gen Supt: J. A. Lewis
NEW CORNELIA BRANCH, Ajo,
 open pit mines, Cu, Au, Ag,
 concentrator & Smelter
 Mgr: A. T. Darr
 Gen Supt: J. A. Briggs
COPPER QUEEN BRANCH,
 Bisbee, undergr & open pit
 mines, Cu, Au, Ag, concentrator
DOUGLAS REDUC WKS, Douglas
 Smelter
 Mgr: W. Little
 Supt: M. G. Fowler
PHELPS DODGE MERC CO, Ajo
 Gen Mgr: H. L. Smith, Douglas
 (See N Mex, N Y, Tex)

PIMA MNG CO
 Box 7187, Tucson
 Pres: H. T. Mudd
 VP: F. W. Allen, A. R. Thomas
 A. D. Christensen, H. S. Rye
 Sec: D. P. Evans
 Treas: C. W. Six
 Purch Agt: H. E. Eckstein
 Office Mgr: D. N. Tremper
PIMA MINE, 20 mi SW of Tucson,
 open pit, Cu
 Gen Mgr: F. W. Allen
 Res Mgr: E. D. Spaulding
 Asst Res Mgr: A. A. Friedman
 Ch Eng: J. F. Oik
 Geol: J. A. Journey
 Mech Eng: M. H. Nicholson
 Met: R. E. Herndon
 Elec Eng: A. G. Beesdower
 Mine Supt: J. E. Thurmond
 Asst Mine Supt: A. Hunt
 Mine Frm: D. A. Rich
 Mng Eng: M. D. Martin
3,500-TON FLOT MILL, at
mine
 Mill Supt: G. A. Komadina
 Mill Frm: Maurice Culliffe
 Assay: P. Flores
 (See Calif)

POWER, J F
 Pipey, Calif
CIBOLA #1 MINE, Yuma County,
 surface, undergr, Mn
 Mgr: C. J. Hanshaw
P W MANGANESE MNG
& MFG CO
 Box 81, Blythe, Calif
CIADLA MINE NO 3, Yuma
 County, Mn

RAMSEY, J L
 Vicksburg
RAMSEY MINE, Yuma County,
 Mn
 Under devel

RAWDALL, FRANK
 Box 243, Coolidge
CORA 1-77, LULA, NORTH
STAR MINES, Pinal County, Co

RANKIN, C L
 Flagstaff
MINE, UgO

RANKIN, MASON
 P O Box 1186, Flagstaff
JULIUS CHEE #2, Coconino
 County, UgO

RAN-REX OIL CO
 Bert Smith, Valentine
COPPER GIANT, Mohave
 County, Cu
 Idle

RARE METALS CORP OF
AMERICA

1st Security Bldg, Salt Lake
 City 18, Utah
 Supt of oper: A. A. McKinney
KAMCO PROPERTIES,
 Cameron, Navajo Indian Reser-
 vation, Coconino County, open
 pit, UgO
 Gen Supt: James McFarlane
 Mine Supt: J. C. McFarlane
 Eng: W. L. Fugate
 Prod: 100 tons
300-TON ACID-LEACH MILL,
Tuba City
 Mill Supt: S. M. Runke
 Asst Mill Supt: L. O. Davis
 Mill Frm: L. W. Mead
 Met: W. A. Griffith
 Chemist: G. L. Botts
 (See Idaho, N Mex, Utah)

RENO, NORMAN M
 Box 34, Dragon
KEYSTONE MINE, near
Johnson Camp, Cochise County,
 surface, undergr, Cu
 Idle

REYMENT EXT SILVER
MINES
 Box 521, Superior
REYMENT MINE, Pinal County,
 Au, Ag

RICO MNG CO
 Agulla
 Mgr: P. D. Evans
IRON CHANCELOR MINE,
 Yavapai County, Fe
 Under devel

RODGERS MNG CO
 Box 738, Shiprock
NAVAJO RESVN MINES,
 Apache County, Cu

ROGERS, MEL
 Wenden
DOYLE MINE, Wenden Dist,
 Yuma County, Mn
DASCO MILL
 Idle

ROYX CO, THE
 c/o Louis Strotta, Nogales
PITTSBURGH GRP, Santa Cruz
 County, Cu

ROYAL INVESTMENT INC
 1804 S 9th St, Las Vegas, Nev
SCOTT LODGE, Yuma County, Cu

RYAN RAY
 218 Court Bldg, Evansville,
 Ind
MINE, Coconino County

SALERO-SANTA RITA
MINING & LEASING CO
 Box 735, Patagonia
 Own: V. L. Rutherford
 VP & Mgr: Jack Rutherford
SALERO MINES, Salero, under-
gr, Ag, Pb, Cu, Au, Zn
 Idle

SAN MANUEL COPPER
CORP
 Box 5417, San Manuel
 Pres: W. P. Goss
 VP: F. H. Buchalla
 J. F. Buchanan
 Sec: F. E. Rinehart
 Treas: W. P. Schmid
SAN MANUEL MINE, Cu, Mo,
 Ag, Au, undergr
 Gen Mgr: F. H. Buchalla
 Asst Gen Mgr: J. F. Buchanan

Supt: C. L. Pillar
 Ch Geol: J. D. Pelletier
 Mech Supt: G. A. Bileon
 Elec Eng: W. Gann
 Mine Supt: C. L. Pillar
 Asst Mine Supt: E. K. Staley
 Gen Mine Frm: C. F. Cigliana
 Gen Mine Eng: G. Beinhorn
 Prod: 32,000 tons
32,000-TON FLOT MILL,
Mill Supt: E. V. Given
 Asst Mill Supt: H. K. Burke
 Prod: 150,000,000
REVERB SMELT
 Supt: R. C. Wilson
 Asst Supt: John Collum

SANTA CRUZ COPPER CO
 1311 E 9th St, Tucson
 Pres: D. M. Stranahan
 VP: L. J. Lichy
 Sec: Victor H. Verity
 Treas: A. K. Barranco
VOLCANO & SUNNYSIDE MINES,
 Patagonia, Cu
 Under devel
SAN MIGUEL MINE, Salome
 Idle

SANTA LUCIA
 Arivaca
 Pres: L. B. Shirle, 919 Wells St,
 Fort Wayne, Ind
SANTA LUCIA MINES, 6 mi W
 Arivaca, surface, Cu
 Gen Supt: John D. Mitchell
 Prod: 250 tons

SCHEMMER, FRED D
 Drawer 827, Prescott
COMMERCIAL MINE, Copper
 Basin Dist, Yavapai County,
 7 mi N of Kirkland Jct, undergr,
 Cu

SCHOLZ, E A & CAZIER, J H
 Bagdad
COPPER KING MINE, 7 m. S
 of Bagdad, undergr, Zn, Cu
 Under devel

SELLS, CATO
 P O Box 253, Farmington,
 N Mex
SELLS MONUMENT #2 MINE,
 UgO

SENA MINING CO
 113 Park St, Kingman
MINE, Pegmatites

SEVIERS MINERALS CO
 William H. Robertson
 7710 Huntington Lane,
 Scottsdale
GOLDEN GEM, Mohave County,
 Cu

SHANNON MINES INC
 Rt 3, Box 30, Tucson
GIANT MINE, Pima County,
 Au, Ag

SHANNON MNG CO
(PERU MNG CO)
 Box 309, Silver City, N Mex
SHANNON GROUP, Cochise
 County, Au, Ag

SHATTUCK DENN MNG
CORP
 120 Broadway, New York 5, NY
 Pres: Thomas Barkin
 VP: S. S. Shattuck
 Exec VP: Thomas V. Tozzi
 Asst VP: D. M. Kentro,
 T. W. Newell
 Sec-Treas: John A. Moss
IRON KING MINE, Humboldt,
 undergr, Zn, Pb, Au, Ag, Cu
 Gen Mgr: D. M. Kentro
 Met Eng: A. W. Jeffers
 Chf Eng: L. Bombardieri
 Mech Eng: B. Waples Jr
 Chf Clk: W. Richardson
 Purch Agt: J. G. MacGregor
 Asst Mech: Joe Kachnia
 Mine Supt: Elmer Tomkinson
 Asst Mine Supt: Claude
 Apperson
 Mine Frm: R. L. Hurd,
 R. J. Williams
1,100-TON FLOT MILL, at mine
 Supt: Thomas L. Hoskins
 Mill Frm: Chas. Jones
 Assay: W. Stutler
 (See Colo, Ky, Utah)

SIERRA COBRE MNG CO
 1510 W. Wilshire Dr, Phoenix
CERA COBRE MINE, Maricopa,
 Cu

SIERRITA MNG CO
Donald R McGee, Ruby Star Rt.
Box 35, Tucson
GOLDEN FLEECE MINE, Pima
County, Cu

SISKOM CORP
422 Gazette Bldg. Box 889,
Reno, Nev
OLD RELIABLE MINE, Pinal
County, Cu

SITTON, P A
830 N Central, Phoenix
AMERICAN MINE, Mohave County
Mn
KAHAR NO 4, LONE WOLF
MINES, Maricopa County, Mn

SKILES OIL CO
Tuba City
Mgr: Joe Hall
EAST CANYON #2 MINE,
Coconino County, U₃O₈

SMITH, A S & PETERSON,
F O
Kingman
WHITE ELEPHANT MINE,
Mohave County, Silica

SOUTHERN COPPER MNG
CO
(Lessee, W S (Bud) Talcott,
Box 194, Nogales)
SANTO NINO MINE, Santa Cruz
County, undergr, Cu, Mo
Under devel

SOUTHWEST MINES
CONTR CO
Box 1041, Prescott
Gen Mgr: Joe Ward
GREAT SCOT MINE, 18 mi SE of
Prescott, undergr, Pb, Zn, Au,
Ag
WHITE PEARL, 7 mi S of
Prescott, undergr, WO₃
Lile

SOUTHWEST MNG
INDUSTRIES
1000 N Mt, Tucson
Pres: H B Brauchla
VP: Hubert Layne
Purch Agt: H Clyde Davis
COCHISE MINE, (NORTH STAR)
12 mi S Florence
Gen. Mgr-Geol: H Clyde Davis
Under devel

SOUTHWESTERN IRON &
STEEL INDUSTRIES
1016 Valley National Bank Bldg
Tucson
OMEGA IRON PLACER DEPOSIT,
44 mi NW of Tucson, Pinal
County

STANDARD URANIUM
CORP
Fayon
COPPER KING MINE, Gila
County, Cu
(See Utah & Colo)

STEINBERGER DRILLING
CO
Cameron
Pres: H Steinberger
ALYCE TOLINO, JULIA
SEMOLLIE & JUAN HORSE
MINES, Cameron, open pit, U₃O₈
Under devel

STETTER, J J
Box 27, Quartzsite
TUNGHILL, WO₃
Lile

STEWART, CHAS &
LONDON, BUD
Arivaca
MOLY-O MINE, 3 1/2 mi N of
Arivaca, Pima County, Pb, Ag
Prod: 10 tons per week

STEWART, JACK
800 N Central, Phoenix
BLACK DIAMOND, JOHN JR
GRP, Yuma County, Mn

JAMES STEWART CONST
CO
411 N Central, Phoenix
Supt: Chas H Sutter
CHARLESTON MINE, Cochise
County, open pit, Pb, Zn, Sericite
Under devel
MILL, at mine

STOVAL MANQANESE
MNG CO
850 W Van Buren St, Box 653,
Phoenix
LSA MINE, Superior, Pinal
County, undergr, Mn
Mine Supt: O K Mills

STRONG & HARRIS, INC
5722 E Scarlett, Tucson
BLUE BELL MINE, Yavapai
County, Cu
CORONADO MINE, Cochise
County, Cu
GOLD HILL MINE, 11 mi SW of
Tucson, open cut, Pima County,
Cu
SAGINAW MINE, Pima County,
Cu

SUNBURST MNG CO
John E Ebdon, Box 911, Patagonia
MULATTO QUARTZ MINE,
Santa Cruz, Au, Ag

SUNRISE MNG CO
Box 52, Amado
Pres: A P Simons
Res Mgr: C N Iversen
OLIVE MINE, 8 mi E of Amado
in Santa Rita Mts, undergr, Pb,
Ag, Zn
Mine Supt: Alvin M Durazo
Prod: 15 to 25 tons
(See Tex)

SUNSHINE MNG CO
738 Peyton Hldg, Spokane,
Wash
BOUSE OPERATION, Bouse
Dist, Yuma County
Mgr: Pat De Williams
BLACK BIRD & BLACK HILLS
MINES, near Bouse, surface, Mr
606-TON MILL

SUPERIOR INDUSTRIES,
INC
P O Box 593, Superior
Pres: O T Ball
MARY T & SANDY NO 2 MINES,
Superior, open pit, perlite
Gen Mgr: O T Ball
Asst: Marion Moggetti

TAYLOR, OTIS B
P O Box 753, Benson
MINE, U₃O₈

TEJON MINE LSG & DEV
CO
Box 603, Tombstone
Own: William Ward
TEJON MINE, 18 mi NE of
Tombstone, undergr, Cu, Pb,
Au, Ag
Lile

THREE C RANCH MINE
3C Ranch, Oracle
Own & Oper: Mary West
MINE, Pinal County, 7 mi E of
Oracle
Gen Supt: E L Castle
MILL, at mine
Supt: Lee Boyer

TITAN URANIUM CO
c/o A J Giannini, Albuquerque,
N Mex
R F & R MINE, Apache County,
surface, undergr, U₃O₈, V

TOMBSTONE DEVEL CO
Sub-lessee, M L Pate, Frank
A Baby, Wickenburg
PROMPTER-OREGON MINE,
3 1/2 mi S of Tombstone,
Cochise County, undergr, Mn
Prod: 150 tons per week

TONTO MINES
Payson
BEELINE MINE, E. C TOP MINE,
TONTO MINE, 30 mi SW Payson,
undergr & surface, Hg
Gen Mgr: C O Carlson
Prod: 50 tons
60-TON GRAV MILL, 3 mi from
mine
Mill Supt: C O Carlson

TRENT EXPLOR CO
Box 243, Abilene, Texas
TRENT MINE, Apache County,
Cu

TRUJILLO & NELSON MNG
CO
Box 145, Winslow
MILLSITE GRP, Coconino County,
Mn

TUCSON PERLITE, INC
4439 N Hwy Drive, Tucson
MINE, Pima County near Superior,
Berri Perlite
PROCESSING PLANT, Jaynes
FUELS INC
8807 Wulshire Blvd, Beverly
Hills, Calif
GEORGEANN MINE, Maricopa
County, Mn

TWIN STAR INDUSTRIES,
INC
1111 S Congress, Austin, Tex
Pres: W B Pratt
VP: John S McNabb
WHITE CLIFF MINE, open pit,
diatomaceous earth
Under devel
TWIN STAR MINE, 1830 E
Hampton, Tucson, pumice, talc,
gypsum
Gen Mgr: C Neil Vogel
Under devel

UNION GYPSUM CO
Winkelman
UNION GYPSUM MINE, Pinal
County, surface, gypsum
Mgr: Archie Lee

U S CONSOL MNG CO
Box 473, Prescott
MINOR GRP, Yavapai County, Cu

U S GUANO CORP
Box 386, Kingman
Pres & Treas: Frank E Ruben
VP: Samuel Reisman
VP: Ben Potts
Sec: M P Crompton
Asst Sec: J Chilson
NAT CAVES, Grand Canyon
Gen Mgr: Varley Crompton
Gen Supt: B A Freiday
Prod: 20 tons

UNITED STATES
SMELTING, REFINING &
MNG CO

75 Federal St, Boston, Mass
Pres: F S Mulock
GOLD MINE, Mohave County
Mn
(See Alaska, Mass, N Mex, Utah)

UNIVERSAL COPPER
CORP
2308 E 17th St, Tucson
Pres: James E Gaylor
ALICE MINE, undergr, Cu, Pb,
Au
Under devel

VANADIUM CORP OF
AMER
Durango, Colo
MONUMENT #2 MINE, Monument
Valley, open pit, U₃O₈, V₂O₅
Mine Frm: Fred Peterson
(See Colo, N Mex, N Y)

VARIOUS METALS CO
Box 72, Heber
Own: John G Patrick
RAINBOW MINING GROUP, 13
mi SW Heber, undergr, surface,
Mn
Mine Supt: W P Miller, Lessee
Prod: 200 tons
30-TON FLOT MILL, at mine
Mill Supt: W P Miller

VESTA ASBESTOS MINES
INC
2343 W Mulberry Dr, Phoenix
Pres: Pat Polsey

VIA DEVELOPMENT
CORP
Box 4266, Santa Fe, N Mex
Pres: C W Via
VP: H H Via
Sec-Treas: Dale Trisler
MANGANESE MINE, undergr
ASBESTOS MINE (leased to
Reynolds Falls Asbestos, Inc,
Phoenix)
BLUE MOON MINE, S of
Globe, undergr, open pit, Au,
Cu

WEEKS, C F
P O Box 239, Kingman
WHITE SPAR MINE, Mohave
County, Silica

WELLS CARGO INC
Box 338, Wickenburg
BLACK DIAMOND GRP, Mohave
County, Mn

WESTERN GOLD &
URANIUM INC
Box 188, St George, Utah
Chrm of Bd: Ralph G Brown
Pres: Russell L Richards
VP: Richard V Jymen
Sec: Berene Backus
Compt: J L Fakler
Mng Dir: C E Prior
ORPHAN MINE, Box 86, Grand
Canyon, undergr, U₃O₈
Ch Geol: Max E Kofford
Met: Jack K Howell
Mine Supt: Maurice Castagne
Mine Eng: Robert Hartmann
Prod: 50 tons
(See Colo, Utah)

ZODIAC URANIUM, INC
305 Ness Bldg, Salt Lake City,
Utah
Pres: Leo G Bateman
VP: M G White
Sec: Paul Jones
Treas: Gladys B Harvey
NAVAJO INDIAN RESERVATION
MINE, surface, U₃O₈
Geol: Leland J Davis
(See Mont)

WESTERN PACIFIC MNG
CO, THE
Box 163, Peach Springs
WESTERN PACIFIC MINES,
Coconino & Mohave Counties, Cu

WHITING, H M
Box 1106, Wickenburg
DESERT ROSE, KNABE NO 6
ML TLOS, LITTLE HORN,
BLACK SUE MINES, Maricopa
County, Mn

WILKERSON, J L & CO
Crown King
Mgr: Ed W Carls
SAVOY MINE in Yavapai County,
Pb, Ag
Under devel

C D WILSON MNG
Box 102, Schuhardt
Op: C D Wilson
MARRAGANSETT MINE, Pima
County, open pit, Cu, Ag, Au
Prod: 250 tons per week

WINN, LOUIS
937 Broad St, Globe
IRON HIVE, KENO, MAGNET
MINES, Gila County, Mn

WOLTMANN, T C
Box 106, Picacho
NO 13 CLAIM MINE, 30 mi SW
Casa Grande, surface, Cu
Prod: 5-10 tons

WOODSON EXPLOR CO
Cameron
Supt: R M Gammell
JACK HUSKON GRP, near
Cameron, Coconino County,
surface, U₃O₈

WORLD MINERALS CORP
132 N Frontier St, Wickenburg
Gen Mgr: M S Clark
Supt: Proctor G Mulliken
SITTON MILL, at Brown's
Crossing, Artillery Mtn Dist,
Mohave County, Mn

ZINKL, ANDY
Tonio Basin
PACKARD MINE & MILL, Gila
County, CaF₂
Under devel

ARKANSAS

ALUMINUM CO OF
AMERICA (RAW MATERIALS
DIV)

1501 Alcoa Bldg, Pittsburgh 19,
Pa
Pres: F L Magee
VP: L Litchfield Jr
Sec: A M Hunt
Treas: E B Wilber
Gen Purch Agt: R O Keefer
Div Gen Mgr: Geo W Streepey
BAUXITE, Bauxite, open pit,
bauxite
Works Mgr: J T Watters
Asst Works Mgr: H W Rucker
Mine Supt: J E Cole
Geol: C C McBride
Mech Eng: M F Garlington

Mng Eng: R L Schell
Prod: 3,000 tons
(See Ill, Ky, Pa)

AMERICAN CYANAMID
CO
Box 246, Benton
QUAPAW MINE, 3 mi NE
Bauxite, surface, bauxite
Mgr, Bauxite Mng:
A W Montgomery
Mgr: R H Harris
MILL, Benton
(See Fla, Ga, N Y, Va)

ARKANSAS GYPSUM CO
Murfreesboro
Pres & Gen Mgr: Vernon B
Lewis
GYPSUM MINE, Murfreesboro,
undergr, surface

ARKANSAS MNG &
EXPLOR CO
Hateville
MINES, N of Batesville, open
pit, Mn

BAXTER, LEONARD
Cushman
MINES, Cushman, open pit, Mn
CAMPBELL BAUXITE CO
Sweet Home
Pres: J Clyde Campbell
PROCESSING PLANT, 1 1/2 mi
SE of Little Rock, Bauxite

CONSOL INDUSTRIES
CHEM CO, (DIV OF
STAUFFER CHEM CO)
6910 Fannin St, Houston, Tex
BAUXITE MINES & PLANT,
open pit, bauxite
Peiser Spur Plant
Ch Acct: Gleason W Coleman

DICKINSON - McGEORGE,
INC
Box 246, Pine Bluff
MINE, bauxite

DULIN BAUXITE CO
Sweet Home
MINE, bauxite

GUARANTY FINANCE CO
P O Box 1213, Batesville
MANGANESE MINE

HARGUS MNG CO
Box 159, Batesville
Pres: W H Hargus
SMITH MINE, Cushman & Mena,
open pit, Mn
Mine Supt: Will Hargus Jr
Prod: 8 tons
GRAY MILL, Cushman

HOUSE, H L
Batesville
MINE, Independence County, Mn

LA FAY, GUSS W
283 E Chestnut, Batesville
Pres: Guas La Fay
Sec: Jean La Fay
MINE, open pit, Mn
Assayer: B Williams
Prod: 1-10 tons

MAGNET COVE BARIUM
CORP
Box 4504, Houston 6, Tex
MINE, Magnet Cove, undergr,
barite
Gen Mgr: James S Startis
Mine Supt: Marvin Verser
Ch Eng: Fred Scharf
Met: B C Harding
Geol: Harry Metcalf
Mine Frac: Roy York
Prod: 1,300 tons
1,200-TON FLOT-MILL,
Malvern
Supt: E H Spraggins
(See Fla, Mo, Nev, Tex, Wyo)

MILLER & MC GEE
Batesville
MINES, N of Batesville, open
pit, undergr, Mn

MINERAL SALE CO
Box 1081, Batesville
MINE, Mn

NATL LEAD CO,
BAROID DIV
P O Box 356, Malvern
Gen Supt: E C Farrell
Asst Supt: W A Halbert
Mine Supt: A J Higgins
Mine Frm: James E Battreal
MINE, Malvern, open pit, barite

Prod: 1,500 tons
1,500-TON FLOT MILL, 10 mi
N of Malvern
Mill Supt: W F Brooks
Asst Mill Supt: V C Bago
Mill Frm J D Wallace
(See Calif., Colo., La., Mont., Nev., N.Y., Tenn., Tex., Wyo.)

NORTON CO

Worcester 8, Mass
Treas: W H Parks
NORTON PLANT, Mo
Idle

POROCAL CORP (SUBSID MINERALS & CHEM CORP OF AMERICA)

Essex Turnpike, Mont Park,
N.Y.
Pres: C A Spacht
VP: A G Blake
Sec: M C Flint
Treas: R J Brochmann
Prod Div: T L Faltner
MINE, Berger, open pit,
bauxite
Gen Mgr: M H Rowland

REYNOLDS MNG CORP

Boyle Bldg, Little Rock
Pres: Walter L Rice
VP: R H Ziegler
Sec: Allen Dillard
Treas: C E Coghill
Purch Agt: M W Henry
REYNOLDS MINE, P.O. Box 238,
Bauxite
undergr, open pit, bauxite
Gen Mgr: R H Ziegler
Gen Supt, surface: J A Fuller
MINE Supt:
MINE Supt, undergr: G M Wagner
Asst MINE Supt: J C McParlin
MINE Eng: J R Krause
Prod: 1,500 tons
100-TON FLOT MILL, Eagle
Pass, Tex
Mgt: E O Boret
Mill Supt: E G Oviatt
Asst Mill Supt: D B Banker
(See Colo., Va.)

RUSH CREEK MNG & EXP CO, INC

Box 145, Yellville
Pres: C T Black
VP-Treas: W C Barnett
Sec: Garvin Pitts
RUSH MNG PILED, Yellville,
undergr, Zn
Mgt: C C Corbin
Supt: Van Walters
Eng: John McMenor
Under devel
300-TON FLOT MILL, Yellville,
Zn
Supt: Van Walters
Asst Supt: John McMenor

U S MANGANESE CORP

Batesville
MINE, Mo
UTLEY, HARVEY
Box 431, Batesville
MINES, N of Batesville, open
pit, Mn
10-TON MILL, Ind County
Assayer: Bruce Williams

CALIFORNIA

AMERICAN ASBESTOS MNG CORP

11 W 42nd St, New York
MINE, Calaveras County,
asbestos
Idle
VOORHEE MINE, Copperopolis,
asbestos

AMERICAN CHROME CO

1 Montgomery St,
San Francisco
Pres: Willie A Swan
VP & Gen Mgr: John Bley
Sec: Geo M Spreading
Treas: John L Lukens
Purch Agt: D W Graves
MOUAT MINE, Nye, Montana
(See Montana)

AMERICAN MINERAL CO

495 S Mission Rd, Los
Angeles 33
Pres: E J Ellsworth
VP & Mgr: W A Merle
Sec: D D Murphy
WHITE ROCK MINE, Cantil,

open pit, ceramic clays
MINE Supt: Paul Edgemon
Prod: 300 tons per month
MARTY-WHITE MINE,
Dryman, open pit, ASIO₃
Prod: 300 tons per month
100-TON BALL MILL & DRYERS
& RAYMOND ROLLER MILL,
at mine
Mill Supt: L E Gehlke

AMERICAN POTASH & CHEM CORP

3000 W 6th St, Los Angeles,
La
Pres: Peter Colfax
VP, Sales: Wm J Francis
Sec: Fred Marais
Purch Agt: Lawrence H
Cornelius
SEARLES LAKE MINE, Lake
Brines, Trona, potash, borax,
soda salts, Br, La
Gen Mgr: M L Leonard
MILL & SMELTER, Trona

AMERICAN SMELTING & REFINING CO

405 Montgomery St,
San Francisco
MINING DEPT
Res Geol: L K Wilson
BLAST FURNACE, Selby, lead
Mgt: J T Roy
Asst Mgr: G H Playter
Gen Supt: B N Shedd
Purch Agt: C P Cough
Smelter Supt: F C Moran
Refin Supt: Al Lubbe Jr
Mast Mch: J L White
(See Ariz., Colo., Idaho, Ill., Mo.,
Mont., Neb., N.J., N Mex., N.Y.,
Tex., Utah, Wash. and Federal
Mng & Smelting Co., Mo.)

ANACONDA COMPANY, THE

25 Broadway, New York 4, NY
Pres: C M Brinckerhoff
Exec VP: Edward S McGlone
Sec-Treas: Ralph E Schneider
Dir of Purch & Sales Harris
DARWIN MINE, Darwin, undergr,
Pb, Zn, Ag
Idle
FLOT MILL, Darwin
Idle
SHOSHONE MINE, Tocopca,
undergr, Pb, Ag
Idle
125-TON FLOT MILL, at
Shoshone mine
Idle
(See Idaho, Mont., Nev., N Mex.,
N.Y.)

ANTONOWITSCH, JOHN K

Box 2032, Grass Valley
UNITARY MINE, Nevada
County, Au, Ag

APEX MNG & MINERALS CORP

1003 E Valley, San Gabriel
APEX & ROYAL MINES, Tulare
County, WO₃

ARGENTINA CONS MNG CO

1235 Carlton Dr, Glendale
Pres: Harry Lee Martin
VP & Sec: Edwin C Horrell
MINE, Ag, Pb, Zn, V₂O₅
Idle

ARISMAN, FRED J & HILL, T H

Box 38, Copperopolis
CALAVERAS COPPER & EMPIRE
CONSOLIDATED MINES, Calaveras
County, Cu

ATKINS, H W

P.O. Box 324, Bishop
BETTY ANN MINE, Mono
County, Pb, Zn

ATKINSON MINE

c/o D B Bessner, P.O. Box 615,
La Habra
BLACK LEAD MINE, San
Bernardino County, Pb, Zn

BARS, P & SHOEMAKER, S B

P.O. Box 538, Lone Pine
SANTA ROSA MINE, Inyo
County, Pb, Zn

BEAM SMELTERS & IMPERIAL MINES, INC

10535 Buford Ave, Inglewood 2
Own: L Mills Beam

BEAUGUARD, D J & E

437 E Pine, Blythe
SIERRA WASHINGTON GRP,
Mono County, Au, Ag

BECKES, LESTER

Rt 2, Box 189, Sonora
NEW HOPE MINE, Tuolumne
County, Au, Ag

BERGER, FRED V JR & FANNESBACK, WAYNE M

17050 "B" St, Victorville
GOLDEN EAGLE MINE, San
Bernardino County, Au, Ag

BEST MINES CO

Box 177, Downsville
Pres: L L Best
VP: B C Austin
Gen Mgr: L L Huelsdonk
OLD BLUFF, BRUSH CREEK
& OXFORD MINES, undergr, Au
MINE Supt: W T Reed Jr
Eng: B C Austin
Master Mch: A B Hinton
FLOT MILL
Supt: John Folsom
Frm: Vernon Huffman

BIG CHIEF MERCURY MINES

Box 275, Middletown
Own: W L MacKinnon
BIG CHIEF MERCURY MINES,
undergr & open pit, Hg
Asst MINE Supt: Eddie Austin
Under devel

BIG ROCK MNG CO

P.O. Box 390, San Andreas
BIG ROCK PLACER, Calaveras
County, Au, Ag

BINKINGER, ROY

Gen Del, Dobbins
GOLDEN YUBA MINE, Yuba
County, Au, Ag

BLACK GIRL MINES CO

271 N Monterey Rd, Palm
Springs
VP & Gen Mgr: J M McFadden
Sec: Doris E McFadden
Geol: C H Shaw
(See Calif.)
BLACKHAW, A E & ASSOC
328 Carillo St, Santa Rosa
BOCKATES (FROEHE) MINE,
Sonora County, Hg

BLACKSTONE MINES, INC

9208 Barrett Ave, Richmond
Pres: Lawrence A Sanchez
VP: Louis G Sanchez
Sec: Uno Lipisto
BLACKSTONE MINE, West
Point, undergr, Au, Ag, Pb
Gen Mgr: L A Sanchez
Gen Supt: E H Syms
50-TON FLOT MILL, at mine
Supt: Levi Lipisto

BLUE DIAMOND CORP

1850 S Alameda St, Los
Angeles 54
Pres: N J Redmond
VP, Prod: W G Bradley
Sec: Gene G Curry
VP-Treas: T L Donoghue
Purch Agt: B M Martz
(See Mex)

BLITHE MANGANESE CO, INC

8827 W Olympic Blvd
Beverly Hills
Pres: Georges F Krenn
Sec: G Walkenbauer
ARLINGTON GROUP, P.O.
Box 325, Blythe, undergr &
open pit, Mn
Prod: 150-150 tons
300-TON GRAB MILL, Inca
siding
Mill Supt: A F Garlik

BOUVIER, ALEXIS R

P.O. Box 237, Calhoun
WILDCAT QUARTZ, Siskiyou
County, Au, Ag

BRADLEY & ECKSTROM, INC

24 California St,
San Francisco
Pres: E O Eckstrom
VP & Gen Mgr: B F Helmke
MINES, Ariz., Calif., Nev., Utah
Idaho, Ore., surface & undergr,
Cr, Fe, Ca₂, Mn, WO₃, rare
earths, asbestos
Supt: C Robinson
(See Idaho)

BRADLEY & HORN

Twenty Nine Palms
MINE, San Bernardino County,
Fe

BRADLEY MINING CO

660 Market St, Rm 515,
San Francisco 4
Pres: Worthen Bradley
Exec VP: John D Bradley
Sec-Treas: G C Orton
REED MINE, Lower Lake, Hg
(Leased)
SULPHUR BANK MINE,
Clearlake Oaks, Hg
GREAT WESTERN MINE, Middle-
town, Hg
Idle
(See Idaho)

BRANTON, JOHN H

French Gulch
YANKEE GULCH MINE,
Shasta County, Cu

BRIGGS, HARRY E

Box 613, Trona
RED CLOUD MINE, 10 mi E of
Bullard, Panamint Mts, undergr,
Au, Ag, Pb
Under devel
SOUTHERN HOMESTEAK MINE,
8 mi S of Bullard, undergr,
Au, Ag
Under devel
GOLDEN EAGLE, 5 mi SE of
Bullard, undergr, Au, Ag, Pb
Prod: 10 tons
10-TON GRAB MILL

BRIGHT, RICHARD L

3514 Garretts Ave, Azusa
YELLOW ASTOR MINE, Kern
County, Au, Ag

BUCKMAN LABORATO- RIES, INC, MNG DIV

Coyote Road, Cloverdale
Pres & Gen Mgr:
Dr S J Buckman
VP: W D Stitt
Sec-Treas: C H Turner
Purch Agt: M Blakeslee
BUCKMAN MINES, undergr,
open pit, Hg
Gen Mgr: Roger N Miller
Gen Supt: Harold D Field
Frm: A E Turpin
80-TON MILL, at mine

BUENA VISTA MINE

Box 333, Templeton
Own: Harold J Biagini
BUENA VISTA MINE, Adelaida
Rd, 17 mi W of Paso Robles,
open pit, Ag
MINE Supt: Rudolph Ruda
Prod: 115 tons
25-TON MILL at mine
MILL Supt: Errol Odd
Asst Mill Supt: D-e Fitzhugh

BUENA VISTA NO 2 MINE

Box 25, Redding
Own: H G Graves
MINE, 3 mi W of Redding, Au,
Cu, WO₃
20-TON FLOT MILL
Idle

BULLARD, H L

Box 57, El Portal
OLD TIME MINE, Mariposa
County, Au, Ag

BUNKER HILL CO, THE

The Bunker Hill Bldg,
690 Market St, San Francisco
Pres: John D Bradley
VP: Emmett G Solomon,
W G Woolf, D L Feathers,
R H Cutting, H E Lee
Sec: D L Feathers
Treas: Emmett G Solomon
Purch Agt: G Mayes, Kellogg,
Idaho
(See Idaho, Wash.)

BURELSON, GEORGE VIA FORTUNA CORP

P.O. Box 343, Brawley
ANNEX #2 & 7, Imperial
County, Pb, Zn

BURRO-SHOE MNG CO, INC

3633 Baylor St, Duarte
Pres: Audley Smith
VP: Cash L Swinney
Sec-Treas: Wm J Clark
BURRO-SHOE MINE, Saline
Valley diat, open pit, Cu, Mo,
Au, Ag
Under devel

BURTON BROS, INC

Rosamond
Pres & Gen Mgr: C G Burton
TROPICO MINE, S and W of
Rosamond, undergr, Au, Ag
Asst Mgr: G A Settle
Idle
CACTUS QUEEN MINE, 10 mi
NW of Rosamond
100-TON CYANIDE MILL, at
mine
Frm: Alec Burton
SMELTER, at mill
Prod: 1,600 lbs gryn

BUTLER C C & SMET- HURST, W R

Browns Valley
BROWNS VALLEY GRP, Yuba
County, Au, Ag

BUTTE MINES

3315 La Cresta Dr, Bakers-
field
Own & Op: J B Huston
BUTTE-MINE, 13 mi E of Glenn
ville, undergr & surface, WO₃
Geol: Chas Shaw
MINE, Rand mg dist, placer,
Au, WO₃
Prod: 150 tons
under devel
MILL, at Glennville

CALAVERAS CENTRAL GOLD MNG CO, LTD

Angels Camp
Pres & Gen Mgr: Harry Sears
Mgt: Desmond Sears
MINE, undergr, placer, Au
KUSHING & SCRUBBING
PLANT, Au, Hg aggregates
Prod: 525-850 tons

CALIFORNIA INDUSTRIAL MINERALS CO

P.O. Box 395, Frisant
Own: Forrest S Taylor
TAYLOR MINE, or Frisant,
volcanic ash
150-TON DRY MILL

CALIFORNIA LIMESTONE PRODUCTS

Box 1064, Blythe
Pres & Mgr: S S Hall
VP: John Scoovjian
Sec-Treas: Maurice Willows Jr
LANGDON MINE, Box 1064,
Blythe, 22 mi NW of Blythe,
undergr & surface, Mn
Gen Mgr: S S Hall
Gen Supt: James F Carr
Prod: 300 tons of Mill grade
ore

CALIFORNIA PORTLAND CEMENT CO

Genl Petroleum Bldg,
612 S Flower St, Los Angeles
BASINCAVE CANYON, BAXTER
San Bernardino County, Fe

CALIF UKIAH MINES

Rt 1, Box 3788, Ukiah
UKIAH MINE, Colusa County,
Hg

CALRADO DEVEL CO

Box 1064, Blythe
Co-Part: S S Hall &
Maurice Willows Jr
BLACK JACK-ARLINGTON
MANGANESE MINE, 22 mi NW
of Blythe, surface & undergr
(Leased to Blythe Manganese Co.)

CHLORIDE CLIFFS MINE

Beatty, Nev
MINE, Inyo County, undergr,
Au, Pb
Idle

CLAIM BROS

P.O. Box 3, Trona
LITTLE GIANT & MARGARET
MINES, Inyo County, Au, Ag

COG MINERALS CORP

Denver Club Bldg, Denver,
Colo
ABBOTT MINE, Williams,
undergr, Hg
Mgt: C O Reed
Geol: F D Hanson
Frm: A J White
Prod: 80 tons
60-TON-2-ROTARY FURNACE
MILL, at mine portal, Hg
(See Colo, Utah)

COLUMBIA-SOUTHERN CHEM CORP - (SUBSD OF PITTSBURGH PLATEGLASS CO)
81, Gateway Center,
Pittsburgh 22, Pa
PLANT, Bartlett, Owens Lake
dist, borax
Plant Supt: Carl P Bodke
Under devel

CONVERSE, ERNEST
Coulterville
GOLD STAR & DONNA MINES,
Mariposa County, Au, Ag

COOPER, HENRY B
Box 453, Comptonville
MINE, Au, Ag

CORDERO MINING CO
131 University Ave, Palo Alto
VP: S H Williston
Gen Mgr: J Eldon Gilbert
MAY LUNDY MINE, Mono,
10 mi W of Mono Lake, Au
Idle

QUEN SABBIE MINE, Hollister,
19 mi E of Hollister, undergr,
Sb
Idle

Gen Supt: Herbert Mitchell
(See Idaho, Nevada)

CORONADO COPPER & ZINC CO
523 W 6th St, Los Angeles 14
Pres: Geo D Dub
VP: H T Mudd
(See Ariz)

CRAIG, MRS C M
2457 Portola Way, Sacramento
FERRIS GRAVEL CO PLANT
American Riv Dist, placer, Au,
Ag
MAGGIN GRAVEL PITS &
DEL PASO GRAVEL PITS
Folsom dist

CRYSTAL BALL MNG CO
21440 Bertram Rd, San Jose
MINE Santa Clara County,
undergr & open pit, Hg
Gen Mgr: Woodrow Goodman
Gen Supt: Frank U Thompson
Geol: Jack Whitaker
Mech Engr: Arthur Morrill
Prod: 14 tons
MILL & REFINERY, at mine
Mill Supt: Wm Duarte
Prod: 17,368 lbs Hg yrlly

CUMMINGS - ROBERTS
738 N Highland Ave,
Los Angeles 38
Gen Part: H Evan Roberts
(See Mont)

CURTIS, (THOMAS), T F
Box 6, Baker
JUNIPER MINE, San Bernardino
County, CaF₂

CYPRUS MINES CORP
1204 Pacific Mutual Bldg,
Los Angeles 14
Pres: H T Mudd
VP: A R Thomas
VP & Treas: H S Nye
Sec: L A Garrett
Purch Agt: W F Stover
(See Ariz, Colo)

DAKIN CO
2811 Hillside Dr, Burlingame
Pres: Fred H Dakin
VP: Wesley W Kergan
Sec: Henrietta Dakin
UNCLE SAM MINE, 10 mi NW
of Central City, Shasta County,
undergr, Au, Cu, Zn, Ag
Idle

DART CONSTRUCTION CO INC
10930 Mac Arthur Blvd,
Oakland
SLEEPY HOLLOW RANCH
PLACER, Calaveras County,
Au, Ag

DAVENPORT, FRED W
Box 557, Tama
SIDEWINDER MINE, Kern
County, Au, Ag

DAVID, BARRY F
Box 181, Bishop
POLETA MINE, Inyo County,
Au, Ag

DE GRIO, ROLAND P
P O Box 903, Alleghany
THOMAS MICHAEL MINE,
Sierra County, Au, Ag

DEL MONTE PROPERTIES CO, SAND DIV
Box 150, Pacific Grove
Pres: Richard Osborne
Gen Mgr: H H Bein
Sales Mgr: P C Valentine
Met: Henry Benesh
Gen Supt: C J Houseman
DEL MONTE SAND PLANT,
Del Monte Forest, Pebble
Beach, surface, glass sand,
quartz, feldspar, gr sand
Prod: 800 tons
800-TON FLOT MILL

DIATOMIC CHEM PRODUCTS CO, INC
1516 Industrial St,
Los Angeles 21
Pres: Charles L Seymour
VP: Carmen Esposito
Sec-Treas: John F Atwill
DIATOMIC MINE, Hay I,
Lompoc, open pit, diatomite
Gen Supt: D B Stephens
Prod: 30 tons processed
calcined
2,000-TON MILL, Lompoc

DICKEY EXPLOR CO
Alleghany
ORIENTAL LOGE MINE, undergr
Au, Ag
Gen Mgr: Donald R Dickey
Geol: W Fuller
Mine Frm: Frank Knapp
75-TON FLOT-GRAV MILL,
at mine
Assay: Abbott Hanks

DOUBLE O TIMBER & MNG CO
200 Davis St, San Francisco 11
VP: Hans Hammer
Sec-Treas: Albert S Simrak
DOUBLE O MINE, 50 mi NE of
Auburn, Placer, Au
Idle

DOWELL, C J
2103 Skyline Dr, Redding
LITTLE FROG, ST JUDE &
WHISKEY HILL MINES,
Shasta County, Au, Ag

DUNCAN, DONALD
10446 Cobasset St, San Valley
LAST HOPE MINE, Kern
County, WQ₃

EAST RIDGE CO
633 Shatto Place, Los Angeles
Pres: C E Byrne
VP: F Woldenhauer
Sec: Alice Davenport
(See Colo)

EDGECLUMBE EXPLOR CO
281 S Hudson, Pasadena 5
Pres: Mrs Charlotte Morgan
VP: C A Haley
Sec: Arnold Holden
Treas & Gen Mgr: G H Morgan
(See Alaska)

EL DORADO Limestone CO
Shingle Springs
Pres: J H Bell
VP: E O Schnetz
Gen Mgr: C R Nichols
Purch Agt: G L Darrington
Gen Supt: W H Stinson
Sec: H P Armes
Elec Eng: Paul Ransom
Limestone MINE, 4 1/2 mi
SW of Shingle Springs, undergr,
limestone
Mine Supt: F G De Berry
Prod: 600 tons
MILL, Crushing, Washing
Screening
Mill Supt: Paul Ransom

EL DORADO - PLUMBAGO MINES CONS, INC
211 Octavia St, San Francisco
Pres: Ernest C Heath
VP & Purch Agt: Lewis C Adams
Sec-Treas: Richard H Wong
Asst Sec-Treas: Geo V
Baptista
EL DORADO-PLUMBAGO
MINE, Box 903, Alleghany,
Sierra County, undergr, Au
Gen Mgr-Mine Supt:
Roland P DeGrio
Geol: Thomas H Taylor
50-TON FLOT MILL, at mine

ELECTRONIC MINERAL & DEVEL CO
Box 269, Santa Clara
DAWSON MINE, Kings County, Hg
FLORENCE MACK MINE, San
Benito County, Hg

EMBASSY MNG & DEVEL CO
P O Box 501, Alameda
MINE, Au, Ag

ENDURANCE MNG CO
120 Chester Ave, Bakersfield
RED STAR (YELLOW JACKET)
MINE, Au, Ag

EVERGREEN MNG CO
c/o Bank of America, Folsom
MINE, Nevada County, Au, Ag

FAIR OAKS GRAVEL CO
4000 Illinois ave, Fair Oaks
GRAVEL PLANT, Sacramento
County, Au

FAIRVIEW PLACES
Lewiston
(Joint venture of Sunshine Mng Co
& The Idaho Canadian Dredging
Co)
Own, Rep & Gen Mgr:
H B Murphy
Purch Agt: A D Soule
PLACER, 10 mi N of Lewiston,
8,000 yd bucket dredge, Au, Ag
Supt: H C Young

FERNANDEZ, FRANK C
1325 Pine St, Santa Monica
Gen Mgr: George Grave
MONO PLUTE RAINBOW MINE,
16 mi NE of Bishop, undergr,
surface, Au, Ag P₁
25-TON GRAV MILL, Plute
Canyon
Idle

FIBREBOARD PAPER PRODUCTS CORP (PABCO BLDG MATLS DIV)
475 Brannan St, San Francisco
Pres: W L Keady
VP: B P Altick, E W Carey
R R Galloway, A S Halley,
J F Hayward, O C Majors
W K Spence
Sec: J S Mitchell
Treas: V H Erickson
Gen Mgr: R R Galloway
(See Colo, Nev)

FINLEY, B C
P O Box 657, Lone Pine
SILVER SPOON MINE, Inyo
County, Pb, Zn

FLEXIFORE ENGINEERING & MNG CO
681 Market St, San Francisco
WALLIS MINE, Shasta County,
Cu

FLINTKOTE CO, THE (US LIME PRODUCTS DIV)
2244 Beverly Blvd, Los
Angeles 37
Pres: J J Harvey Jr
Gen Mgr: Kennedy Ellsworth
Asst Gen Mgr: Hardin Stephens
Gen Supt: Nev, Ariz. W E Ellis
Res Mgr: Nev, Ariz

Prod Mgr: L N Grindell
Res Mgr: Wm McCandish
SONORA MINE, Tuolumne
County, undergr
(See Ariz, Nev, Tex)

FLUORSPAR MNG CO
P O Box 308, Winterhaven
Pres: Kenneth Holmes
OROCHOPIA MINE, Riverside
County, CaF₂

FOOD MACHINERY AND CHEMICAL CORP (WESTVACO MIN PROD DIV)
Box 337, Newark
Res Mgr: S M Cimino
Asst to Res Mgr: D C Linton
Oper Supt: L A Bowler
WESTVACO MINE, Box 981,
Hollister, surface, dolomite
Prod: 600 tons
Mine Supt: R Swindlehurst
600-TON MILL, Hollister
Mill Supt: R Swindlehurst
Assay: Norman Cunha
(See N Mex)

FOREST MINES, INC
Forest
Pres: Cecil T Vivian
Sec-Treas: Virginia A Vivian
Gen Mgr: Cecil T Vivian
NORTH FORK MINE, Forest,
Sierra County, Au, quartz,
undergr, Placer
Idle

FOSTER, CLYDE T
P O Box 382, Mariposa
SWEETWATER MINE, Mariposa
County, Au, Ag

FOSTER, JACK B & PAYTON, JAMES D
10245 Santa Anita, Montclair
MATCH A WATCHEE MINE,
San Bernardino County, Au, Ag

4-D MNG CO
C/o Clyde Hewitt,
Box 276, Johannsburg
YELLOW ASTOR MINE, Kern
County, Au, Ag

FOUR-GEE MINE
Box 989, Escondido
Own: H Golen
FOUR-GEE MINE, Escondido,
Pyrophyllite

FREDERICKSON, HAROLD
1723 E Harvey Ave, Fresno
MALONE MINE, Mariposa
County, Au, Ag

FRIDAY NICKEL SYNDICATE
3105 Wilshire Blvd,
Los Angeles 5
Pres: D B MacAfee
VP: Dudley Cornell
Sec: Saul J Bernard
Treas: Marvin L Tragerman
Tech Dir: M W MacAfee
FRIDAY NICKEL MINE, Julian,
undergr, Ni, Co, S

FULLER, FRANK J
Box 1245, Jackson
CENTRAL EUREKA, Amador
County, Au, Ag

GENERAL MNG CORP
8272 Sunset Blvd, Los Angeles
Pres: E J Speake
VP: Don Carly
Sec: Allan Thody
Treas: Howard Mallring
(See Ariz)

GIBRALTAR MNG CO INC
Box 216, Paramount
Pres: Wm Sievers
VP: Raymond Sievers
Sec-Treas: Robert Price
GIBRALTAR GROUP, Santa
Barbara, 10 mi NE over Depress-
ion Dr, on Gibraltar Dam, open
pit, quicksilver
Gen Mgr: Wm Sievers
Mine Supt: Arthur Stafford
100-TON MILL, Rotary Furnace

GILES, WANDA & JOSEPH F
Box 1013, Campbell
HUMMING BIRD MINE, Redding
undergr, Au
Under devel

GRAY-AMAL MINE, at mine
GIPSY MINE & MILL CO
1115 Wicks, San Valley
Pres & Gen Mgr: J H Bennett
Sec-Treas: A E Bennett
GIPSY MINE, San Valley, open
pit, Au, Ag, Pb, WO₃
Under devel
60-TON FLOT-GRAV MILL,
Bakersfield

GLADDING, McBEAN & CO
2601 Los Felix Blvd, Los
Angeles, 38
Pres: C W Planje
Sec: R A Eccles
PLANTS, Corona, Ione, Lincoln,
Pittsburgh, South Gate, Los
Angeles
MINES, Amador, Inyo, Kern,
Los Angeles, Orange, Placer,
Riverside, San Bernardino &
Yuba Counties

GLENN CO
103 37th Ave, Oakland 1
Own & Gen Mgr: George G Glenn
Gen Supt: Harry Odgers
MARBLE SPRINGS MINE, 12 mi
E of Coulterville, undergr, Au,
Ag, Pb
50-TON FLOT MILL
Mill Supt: Frank Lane
Idle

GLIKO, FRANK B
Grass Valley
NEW VERDE MINE, Nevada
County, Au, Ag

GOLD CROW MNG CORP
c/o Frederick H Giles,
Alleghany
GOLD CROWN MINE, Sierra
County, Au, Ag

GOLD HILL DREDGING CO
311 California St, San Francisco
Pres: J J Conroy
Asst Sec: H S Gilbert
Asst Treas: C A Ames
Purch Agt: E O Perkins
PLACER PROP ON
Mokelumne Riv
in San Joaquin County, Feather
Riv in Butte County backfills,
Ag As
Supt: H L Conroy
Idle

GOLDEN DEAR MINE
498 N Bowling Green,
Los Angeles 48
Pres: Edwin J Dear
MINE, Ord Mts, 15 mi W of
Lucerne, undergr, surface,
UGOs,
Th, Ag, Au
Under devel

GRANTHAM MINES
1915 S Coast Hwy,
Laguna Beach
Own: Lonnie Grantam
WARM SPRINGS TALC
DEPOSIT,
Inyo County, Talc
BIG TALC, 40 mi NW of
Shoshone,
Talc
Mine Supt: John Odgers
Mine Frm: Tom Hardman
Mine Engr: H H Franklin

GREAT LAKES CARBON CORP (MNG & MINERAL PROD DIV)
612 S Flower, Los Angeles 17
Pres: O Stakel Jr
VP & Gen Mgr: D Marriot
Asst Gen Mgr & Sales Mgr:
J Maran
Purch Agt: J Hughes
Tech Dir: P Leppla
GREAT LAKES CARBON CORP
QUARRY, 8 mi E Lompoc, open
pit, diatomaceous silica
Chief Geol: J W Reinhardt
Plant Oper Mgr: E A Harris
Quarry Oper Mgr: W D Stone
Chf Eng: D F Drysdale
Safety Eng: A K Muir
Supt: J W Rodd
Asst Supt: J Gunderama
Mine Engr: F McCarlett
Prod: 300-400 tons
400-TON MILL, Plant #2, 7 mi
W Lompoc
Mill Supt: E D Ingram
Asst Mill Supt: P Highfill
Mill Frm: M Gyssco
Chemist: J Girard
(See Colo, N Mex, Nev, Ariz)

GULDIN, JOEL A
c/o New Trail Mine,
117A S 1/2 St, Las Vegas
NEW TRAIL MINE, San Bernar-
dino County, Cu

H L M MNG CO
Actas Springs Resort,
Pope Valley
ACTNA SPRINGS RESORT
MINE,
Napa County, Hg

HAMLIN EXPLOR & MNG CO
1012 1/2 E Windsor Rd,
Glendale 5
Pres: William C Hamlin
VP: Robert G Hamlin
Sec-Treas-Gen Mgr:
Clyde H Hamlin
HAMLIN-LEDDY MINE, 13 mi
SE of Twenty-nine Palms, San
Bernardino County, open pit,
undergr, Beryllium, Feldspar
Mine Supt: Jack W Hamlin
Under devel
(See Wyo)

HAMILTON BROS LUMBER CO
P O Box 937, Crescent City
HAMBO MINES #14, #18,
Del Norte County, Chromite

HAMPTON MNG CO.
CHROME DIV (Subsidiary of)
CONSOL VIRGINIA MNG CO, NEV)
288 Loma Dr., Los Angeles 36
Pres: Louis H. Seagrave
Sec-Treas: T. E. Wilson
SAWMILL CREEK MINE, San
Benito County, open pit, Cr₂O₃
100-TON MILL
Mill Frsm: Don Sking

CARL HANSEN & ASSOC
180 Broadway, Berkeley
RED MT MINE, Mendocino
County, Chromite

HARRIS MINE
Box 117, Rancho Santa Fe
Own: C. W. Harris
HARRIS MINE, Pyrophyllite

HARVEY ALUMINUM CO
Turonas
MINE, Salem Hills area, Marion
County, Ore. Ferruginous
bauxite
Esplor
(See Greg)

HAZEL CREEK MNG CORP
3801-38th St., Sacramento
Pres: E. J. Gunther
VP: Dr. C. Lucky
Sec-Treas: B. J. Hoffart
Purch Agt: Frank Wickham
HAZEL CREEK MINE, Box 267,
Pollock, 6 mi SE of Pollock
Placer, undergr. Au, Ag, Pb, Zn
Gen Supt: Martin Rumbold
Prod: 10-100 tons
FLOT-MILL, Hazel Valley
SMELTER, Selby

HEATHER, HARRY F
136 S Oak Knoll Ave.
Pasadena 5
BRIGHT OUTLOOK MINE, San
Bernardino County, Ca, Pb,
WO₃
8 DAUGHTERS, Needles, undergr.
U₃O₈, bentonite
OVERSITE MINE, Ambroy, open
pit, pumice
Idle
(See Aris)

HEAVY METALS CO INC
928 Alamo St., Glendale 1
LA LIBERTAD MINE, San Luis
Obispo County, Mg

HENNINGER, ROY E
P O Box 48, Stanislaus
GRAY SQUIRREL MINE,
Tulare County, Au, Ag

HERBERT, C A
Olancho
NINE MILE CANYON, Tulare
County, Ba
HIGHLAND QUICKSILVER
INC
c/o Steve Somers
Box 908, Coalinga
LOS PICACO MINE, San Benito
County, Mg

HILLEN HOLDING MNG
CORP
1350 N Leman, Menlo Park
Pres: Wm C Holding
VP: P C Hillen
Sec: Keith Petty
Treas: Keith Garner
SONORA URANIUM MINE, Mono
County, undergr, open pit, U₃O₈
Gen Mgr: W C Holding
Supt: P C Hillen
Idle

HOFFMAN, G H & HALL,
J W
Box 143, Proberts
MINE, Au, Ag

HOLDING MINE & DEVEL
CO
1350 N Leman Ave
Menlo Park
Pres: Wm C Holding
VP & Gen Mgr: P C Hillen
SHOESTRING TUNGSTEN MINE,
Mono County, Tioga Pass near
Lee, Vining Canyon, undergr,
open pit, WO₃, Mo, Ag
Idle

HOMESTAKE MNG CO
100 Bush St., San Francisco
Pres: Donald H. McLaughlin
VP: James W. Sweet
Sec-Treas: John W. Hamilton
Purch Agt: H D Anderson
(See So Dak, Utah, Wyo, Home-
stake Partners N Mex)

HOOTES, W A
Valley Springs
PENT MINE, Calaveras County,
Au, Ag
ROTTENDORF, JACK
Ema
RAILROAD LEASE, PED LEO,
& S W MINES, Siskiyou County,
Chromite

HUNTLEY INDUSTRIAL
MINERALS INC
Box 105, Bishop
Pres: W H Huntley
VP: D T Davis
Sec-Treas: Cecile M Huntley
Olc Mgr: J C Leechman
COLTON MINE, 30 mi NE of
Bishop, open pit, pyrophyllite
LAWRENCE MINE, 5 mi S of Tin
Mountain in Ubehebe Range, open
pit, asbestos
PACIFIC PYROPHYLLITE MINE,
20 mi N of Laws, open pit,
pyrophyllite
HUNTLEY TALC MINE, 48 mi SE
of Big Pine, undergr & open pit,
talc
Prod: 10 tons
LITTLE ANTELOPE CLAY MINE,
Hot Creek, Mono County, open pit,
White Kaolin Clay
Mine Supt: D T Davis
100-TON RAYMOND MILL, Laws
Mill Supt: D T Davis
Assay: Fred Yarcho

INDUSTRIAL MINERALS
& **CHEMICAL CO**
6th & Gilman Sts, Berkeley 10
Pres: L S Morette
VP: W S Cowgill
Sec-Treas: A L Forbes
SPANISH MINE, Nevada County
barite
Idle
MILLS, Berkeley and Florin,
non metallic
Mill Supt: Forrest Rhoton
(See Nev)

IRELAN TUBA CO, LTD
1821 Stockton Blvd, Sacramento
IRELAN MINE, Sierra County,
Ag

IRON AGE MINES CO
Twenty Nine Palms
IRON AGE MINE, San Bernard-
ino County, Fe

JOHNS-MANVILLE
PRODUCTS CORP
Lompoc
Plant Mgr: O B Westmont
Asst Mgr: G G Schuchnecht
LOMPOC PLANT, Lompoc,
surface, diatomaceous silica
Quarry & Mines Supt: C W Sphar
Gen Frsm: C C Benedict
Mine Supt: C W Sphar
Main Mine Supt: E W Hodges
MILL, at mine, air separation
Mill Supt: G W Porter
(See NY)

JOLLY JACK URANIUM CO
703 Crescent Ave,
San Francisco 10
Pres: Richard H Hall
VP: Vernon R Allen
Sec-Treas: Stanley S Dunnaway
(See Utah)

JORDAN, CHARLES J &
SETZER, WALTER M
P O Box 11, Shoshone
VALLEY MINE, San Bernardino
County, Pb, Zn

K & F MNG
P O Box 11, San Jose
NEW ALMADEN MINE, Santa
Clara County, Mg

KAISER ALUMINUM &
CHEM CORP
1024 Broadway, Oakland 12
Pres: Henry J Kaiser
VP: D A Rasmussen
Sec: W B Marks
Treas: R A Clayton
Purch Agt: D S Gregg
NATIVIDAD DOLOMITE QUARRY
Natividad, open pit, dolomite
Oper Mgr: J F Knight
Works Mgr: W T Burns
Plant Supt: Ivan Hall
Ool: E A Hansen
Plant Eng: J E Winters
300,000 TON-YR-1-HEAV-
MED-MILL, 5 mi NE of Salinas

KAISER STEEL CORP
1504 Broadway, Oakland 12
Pres & Chmn of Bd:
Henry J Kaiser
VP & Gen Mgr: Jack L. Aubrey
VP & Treas: Alwood Austin
Gen Purch Agt: G W Kelly
EAGLE MOUNTAIN MINE,
Box 158, Eagle Mountain,
surface, Fe
Mgr: M J Hughes
Office Mgr: G R Riser
Geol: R W Brummett
Ch Eng: C E Davis
Master Mech: C A Scott
Gen Frm, Railroad: V A Fischer
Gen Pit Frm: W A Horton
Prod: 7,000 tons
15,000-TON-HEAV-MED-JIG-
MILL, at mine
Gen Frm, Benefic: C W Reno
Ore Dressing Eng: R C Forbes
BLAST FURNACE

KATE HARDY MNG CO
Box 748, Grass Valley
Pres: Harold Hawn
HAWN (KATE HARDY) MINE,
Sierra County, Au, Ag

KENNEDY MINERALS CO
INC
2550 E Olympic Blvd,
Los Angeles 23
Pres: John J Kennedy
VP: A F Escobar
Sec: Paul H Wayne
Treas: Fred L Clover
ECLIPSE, Inyo County
TALC AND DEATH VALLEY,
Inyo, Co
LIMESTONE, Isabella & Kern
Counties

KERN COUNTY LAND
COMPANY
600 California St,
San Francisco 38
Pres: George G Montgomery
Exec-VP, Oil & Minerals:
H L Reid
Mgr, Minerals Dept:
Wm T Griswold
Area Geol: Kenneth M Reim
Box 323, Borman
(See Ariz, Idaho, Utah)

KINCAID, C H
P O Box 1544, Trona
DOODLE BUG MINE, Inyo
County, Pb, Zn

KNEPPER, L W
Box 87, Indira
SANTA RITA, SANTA ANITA,
SAN CARLOS MINES, New
India Dist,
San Benito & Fresno Counties
surface, Mg
EL CAJON MINE, Panoche Dist,
San Benito County, surface, Mg
NORTH STAR MINE, San
Benito County, surface, Mg
Prod: 20 tons

KOSHLER, L J
Indian Falls, Keddle
MINE, Au, Ag

KRITIKOS, W T
2110 W Esclido, Stockton 4
OAT HILL MINE, 5 mi SE
Middleton, Napa County,
open pit, Mg
Mine Frm: H L Cappe
Prod: 10 tons hourly
200-TON OATHILL MILL, at
mine, Mg
Mill Frm: H L Cappe
RETOY SMELTER
2nd conc plant begin operations
Jan 1, 1959

KUBON & JURVA
419 N Emily, Anaheim
RAND MINE, Kern County
Glennville, WO₃
Idle

LAMBERT LOGGING CO
Box 153, Orleans
TWIN LAKES MINE, Humboldt
County, Chromite

LANE, DELMUTH
138 La Jolla Ave,
Los Angeles 48
SPECIMEN MINE, Mariposa
County, Au, Ag

LINCOLN CLAY PROD CO
Box 367, Lincoln
Pres: M J Dillman, Jr
VP: K S Brown
Sec-Treas & Purch Agt:
A S Gulliford
MINE, 1 1/2 mi N of Lincoln
open pit, fireclay
Mine Frm: C O Fardee
Prod: 450 tons
60-TON MILL

LIQUID METAL OIL & GAS
Armstrong & Lincoln
Middlemen
WALL STREET MINE, Lake
County, Mg

LIVE OAK MINES, INC
25556 N Sand Canyon Rd,
Saugus
Pres-Gen Mgr & Purch Agt:
Challenger Thompson
VP: Thomas E Jackson
Sec-Treas: L B Thompson
MINE, open pit, titanium,
magnetite, ilmenite, Au, Pt
Met: Victor Jager
Geol: H C Babbitt
Ch Chem: Samuel Sklarow
Under devel

LOOPER, CHARLES JR
14000 Coleman Rd, San Jose
24
MARGARET MINE, San Benito
County, Chromite

LOW, F OILMAN &
SALONISH, MICHAEL
Pike Star Rd,
Comptonville
ALASKA MINE, Sierra County,
Au, Ag

LUCKY JACK MNG CORP
10335 Buford Ave, Ingleside 2
Pres: L Mills Beam
VP: Harold D Kinney
Sec-Treas: Brass J Beam
LUCKY JACK MINE, Strawberry
Valley, placer, Au, Pt
Gen Mgr & Met: Major Allured

MACCO CORP, BARITE
DIV
14409 S Paramount Blvd
Pres: John MacLeod
VP: John Robinson
Div Mgr: J D Hawkins
Gen Supt: Harry Parker
Purch Agt: Neil Giebler
BARITE QUEEN MINE, Box 266
Inyokern, open pit, barite
Mine Supt: Clark Everett
Prod: 300 tons
200-TON GRAY MILL, Hwy 393
6 mi S of Little Lake
Mill Supt: William Paine
(See Western Barium Corp)

MACCORI, ITALO &
CANAL, FRANK
Box 112, Johannesburg,
MINE, Kern County, Au, Ag

MARKON, ALEX
Sawyers Bar,
ANNIE JOHNSON MINE,
Siskiyou County, Au, Ag

MARTIN, GEORGE H
P O Box 471, Hayfork
LAYMAN MINE, Trinity County,
Au, Ag

MASONIC MINE ASSOC
c/o Mrs. Viola
Heinemeyer, 750 13th St,
#103, Oakland 7
CHANNING MINE, Mono County,
Au, Ag

MAXWELL, RED D
44753 2nd St E, Lancaster
ROGERS-CONTRY (NEWS) MINE,
Los Angeles County, Ca

MERCURY BANKS
P O Box 153, Healdsburg
MERCURY BANK MINE, Sonoma
County, Mg

MILLER, LESTER S
P O Box 32, Greenwood
RUSSEL J WILSON PTY,
El Dorado County, Chromite

MILLS, CHRIS
c/o Bigby Store, Mariposa
RED BANKS MINE, Mariposa
County, Au, Ag

MINERAL MATERIALS CO
1145 Westminster Ave,
Alhambra
Gen Mgr: C W Danton
ATLAS SILICA MINE, P O Box
384, Oro Grande, surface,
silica quartzite
Gen Supt: Roy Hill
Mine Frm: Lloyd Battee
Ch Eng: M W Rodhead
Prod: 200 tons
800-TON MILL, Oro Grande, jaw
crusher and 7 rolls
(See Nevada)

MINERALS PROD CO OF
CALIF
1299 Bayshore Hwy,
Burlingame
Pres: George N Keyatan Jr
VP: H H Van Aken
Sec-Treas: David H Keyatan
MARY MURPHY MINE, Romley,
Colo, undergr, Pb, Zn
Gen Mgr: H H Van Aken
Idle
(See Colo)

MIRACLE MINE
near Bakerfield
Own: H B Mann
MINE, undergr, U₃O₈

MOLYBDENUM CORP OF
AMERICA
Nippon
Gen Mgr: H D Bailey
Asst Gen Mgr: Russell Wood
Met: H S Woodward
MT PASS MINE, 60 mi SW of
Las Vegas, Nev, on US 91,
open pit, rare earth metals
Mine Frm: Ira Proud
Prod: 150 tons
150-TON FLOT MILL
Mill Supt: G H Lee
(See Colo, N Mex, NY, Pa)

MONOLITH PORTLAND
CEMENT CO
643 S Olive St, Los Angeles
14
VP: Hugh D McBride
GOLDSPAR MINE, 25 mi SE
of Beatty, open pit, CaF₂
Supt: Charles Hoffman, P O Box
336, Beatty, Nev
(See Nev)

MOORE CREEK MNG CO
7033 County Club Blvd,
Stockton
MOORE CREEK MINE,
Calaveras County, WO₃

MORRIS RAVINE MNG CO
Box 7, Oroville
Pres & Gen Mgr: J H Sharpe
VP: Roy A Handley
Sec: J R Peterson
MINE, 6 mi NE of Oroville,
undergr, Au

MOUNT GAINES MINE
Hornitos
Own: J W Radil, 444 California
St, San Francisco 4
MT GAINES MINE, Hornitos,
undergr, Au
Supt: J A Siefert
80-TON FLOT MILL
Under devel

MOUNTAIN COPPER CO
OF CALIF
230 California St, San
Francisco 11
Pres: L T Kett
Sec: Duffey F Miller
Treas: E G Rebecher
Purch Agt: E D Dodge
Sales Mgr: M M Stockman
IRON MTH MINE, Matheson
Station, Redding, iron pyrites
VP, Op: C W McClung
Ch Eng: W K Barcus
Pit Frm: W H Calhoun
Prod: 500 tons

MUGWUMP MNG CO, INC
Forest
Pres: Virginia A Vivian
VP: Dr. Steven T. Mayes
Sec-Treas: Fred W. Vailson
Purch Agt: Cecil T. Vivian
MUGWUMP, LIVE YANKEE,
YOUNG AMERICA, EXCHANGE
GOLD BUG MINES, Sierra
County, undergr, placer, Au

MULTI-MINES CORP
2550 E Olympic Blvd,
Los Angeles 23
Pres: John J Kennedy
VP: A F Escobar

Sec: Paul H. Wrayte
Treas: Fred L. Clover
DEATH VALLEY TALC MINE
Inyo County, talc
DEIX MINE, Inyo County, clay

NAT'L LEAD CO. BAROID DIV

1404 Danville, Houston, Texas
HECTOR MINE & PLANT, Newberry, undergr, bentonite
Supt: Jack Herford
MERCED MILL, Merced, dry grinding of barytes
Supt: Less Bunch
(See Ark, Colo, La, Mont, Mo, Nev, NY, Tenn, Tex, Wyo)

NATOMAS COMPANY

607 Fort Blvd, Sacramento
Pres & Gen Mgr: R. G. Smith
VP: Mortimer Fleischacker, Jr., Raymond W. Iches
VP & Sec-Treas: Chandler Ide
Asst Sec-Treas: Wanda Durkee
Chmn of Bd: R. H. Davies
Mgr: Gold Dredging Dept: Cyrtl Thomas
PLACER MINE, Natoma, 20 mi E of Sacramento, Au (See Colo)

NAVAJO MINERAL FUND INC

237 S Fremont St, Las Vegas, Nevada
Pres-Purch Agt: J. J. Sartin
VP: Phillip T. Asaro
Sec-Treas: Ross Sartin
LUCKY JOE MINE, Iron Mt Rd, Eagle Mt Mng dist, open pit, Fe
Gen Mgr: J. Sartin
Asst Gen Mgr: S. H. MacKenzie
Geol-Met-Mine Supt: R. Sholto Douglas
Prod: Approx 500 tons per day
Under devel
500-TON-HEAV-MED MILL, Iron Mt Rd, Mill Supt: S. H. MacKenzie (See Nev)

NEW IDRIA MNG & CHEM CO

Ideia
Pres: C. Hyde Lewis
Sec-Treas: Arthur W. Goring
QUICKSILVER DIVISION, Ideia, San Benito County, undergr, Hg
Div Mgr: Wesley Shaddock
Geol: Robert K. Linn
Mine Frm: Victor Sola
MILL, at mine
STRAWBERRY TUNGSTEN DIVISION
1950 Tyler St, Fresno, undergr, WO₃
Div Mgr: Milan C. Richardson
Office Mgr: Palmer Deines (See Colo)

THE NEW NEVADA METALS REDUCTION CORP

23 El Camino Real, Burlingame
DIVIDEND MINE, Siskiyou County, Au, Ag

NEW PENN MINES, INC

Camp Seco
Pres: R. F. Playter
Sec: J. H. Nicholls
PENN MINE, 1 mi W of Camp Seco, Co, Zn, Ag, Pb, Au
Ideia
350-TON FLOT MILL

NEW VERDE MINES CO

P. O. Box 1097, Grass Valley
BROWN VALLEY GRP, Yuba County, Au, Ag
NEWMAN, EVERETT W
Star Rt, Box 46, Grass Valley
FALL CREEK MINE, Nevada County, Au, Ag

NONA MNG CO

Bernardine St, San Benito
Mgr: A. M. Moreno
NONA MINE #1, San Benito County, Hg
NORRIS, THOMAS D
P. O. Box 111, Keeler
SANTA ROSA MINE, Inyo County, Pb, Zn

NORTHWESTERN MINING CO

P. O. Box 806, Des Moines, Wash
Own: Alfred W. Peeler
BOULDER GULCH GROUP, 8 mi W of Sawyers Bar, Siskiyou County, placer, Au, Ag
Supt: A. Everett Miller
Under devel
(See Wash)

OIL BASE, INC

130 Oris St, Compton
LEVIATHAN MINE, San Bernardino County, Ba

ONTON MINE

Meadow Valley, via Quincy
Own: H. E. Fowler
MINE, 5 1/2 mi S of Ducks Lake, undergr, Au, Ag
Under devel
6-TON GRAY QUARTZ MILL

ORIGINAL 16 TO 1 MINE INC

233 Montgomery St, San Francisco 4
Pres-Gen Mgr: Wm. M. Maxfield
Sec-Treas: Jack Maxfield
VP: C. A. Bennett
MINE, Alleghany, Sierra County, Au, Ag
Gen Supt: C. A. Bennett
Frms: W. C. Hart
150-TON CONG & AMAL PLANT
Mill Frm: J. B. Hunley

ORO FINO CONS MINES CO

Box 432, Auburn
Pres: G. A. Nugent
Treas: J. C. Kempvance
ORO FINO MINE, 4 mi from Auburn, undergr, Au, Ag
Ideia

OVERTON, MAX

833 Garden Ave, Marysville
ST LAWRENCE MINE, Placer County, Au, Ag

PACIFIC FILL PRODUCTS

Box 2178 Term Annex, Los Angeles 54
Pres: John D. Fredericks
Exec VP: Kenneth Barrett
Sec-Treas: Walter M. Colley
Purch Agt: Mary R. Baillie
ALBERHILL MINE, open pit, clay, silica
Supt: J. Harvey Gardner
NORTHERN MINE, open pit, clay, silica
Supt: O. M. Tupper
Chem & Plant Mgr: O. M. Kilgore
100,000-TON-(lyrly)-FLOT MILL, Camanche

PACIFIC INDUSTRIES INC

Box 880, San Jose
Pres: Donald D. Smith
VP: John R. Plant
Sec-Treas: Ronald Bailey
Purch Agt: Nick Eisekovich
CENTRAL EUREKA MINE, Sutter Cr, undergr, surface, potash, P, V, UO₃
Gen Mgr: Nick Eisekovich
Geol: Robert E. McDonald (See Colo)

PACIFIC INSTITUTE

3101 Pasadena Ave., Los Angeles 31
Pres: H. A. Shiffer
VP: Rex James
Sec: A. E. Beaumont
Purch Agt: W. Werneck
KERN FOURTEEN MINE, Tahachapi Mts, Kern County, undergr, WO₃
Ideia
UPPER PARADISE #2, Paradise Mts, Coyote Dry Lake Area, Box 113, Barstow, WO₃
illinite, open pit, undergr.
Gen Mgr: Dr. Clarence Lamb
Geol: Dr. H. A. Shiffer
Met: H. Ellis
Under devel
(See Shiffer Pacific Co. Calif, Nev; H. A. Shiffer, Calif: Upper Paradise Mines, Calif)

PACIFIC MINERALS CO, LTD

337-10th St, Richmond
Pres: C. L. Renwick, Jr
Sec: T. H. DeLap
PLACERVILLE & SHINGLE

SPRING MINES, asphalt, soapstone, slate roofing granules
Mine Supt: C. H. Bishop
MILL
Supt: Ed Bishop
MINE, Whittie
Supt: Curt Wilson
MINE, Box 505, Eureka
Supt: Don Houghton

PACIFIC ORE & MINERALS CORP

5225 Wilshire Blvd, Los Angeles 30
PACIFIC #1 MINE, San Bernardino County, Pb, Zn

PALO ALTO MNG CORP

14900 Coleman Rd, San Jose 24
Pres: Stephen S. Ridgely Sr
VP: Gen E. Carlson, F. H. Smith
Sec-Treas: Mrs. Veta H. Latham
QUADALUPE & CEDAR MOUNTAIN MINES, San Jose, Alameda County, Hg, Cr₂O₃, undergr, open pit
Gen Mgr-Mine Supt: George E. Carlson

PANCO MNG CO

5813 Fremont St, Oakland
BENTLEY RANCH MINE, Fetaluma
Dist, Maria Co, surface, Hg

PERON MNG & MLG CO

Balch Camp, Fresno
Pres: E. G. Peron
Sec: Mrs. Julia Peron
L & M MINE, Balch Camp
via Fresno, undergr, WO₃
Ideia

PHILLIPS, H. J.

1381 Chase Ave, El Cajon
PHILLIPS MINE, 2 mi SE of El Cajon, undergr, Au, Cu, Pb
AMAL-GRAY MILL, Under devel

PIMA MNG CO

523 W 6th St, Los Angeles 14
Pres: H. T. Mudd
VP: A. R. Thomas
A. Christensen, H. S. Nye
F. W. Allen
Sec: D. Evans
Treas: C. W. Six
(See A-12) &

PIONEER PYROPHYLLITE PRODUCERS

Owned by Torrance Sand & Gravel Products Co.
35701 Crenshaw Blvd, Torrance
PIONEER MINE, near Rancho Santa Fe, pyrophyllite
MILL, Chula Vista

PORTER, HAROLD V

Rt 1, Box 84, Caliente
PORTER GRP, Kern County, Au, Ag

POWATHAN MNG CO

6721 Windsor Mill Rd, Baltimore, Md
Pres & Gen Mgr: F. A. Mett
VP & Sec: Ch. Silver
Treas: E. L. Farley
SHASTA COUNTY MINE, open pit, asbestos
Gen Mgr: J. C. Kempvance (See Md)

PREMIER LIMESTONE PRODUCTS

Suite 621, Title Insurance Bldg, 433 S Spring St, Los Angeles 13
Pres: Glenn R. Watson
VP: Donald M. Gustafson
SHEEP CREEK DEPOSIT, vicinity of Wrightwood, San Bernardino County, Calcium Limestone, open pit
Quarry Oper: Dale Douce
Prod: 400 tons per day

PROVIDENCE TUOLUMNE GOLD MINES, LTD

San Francisco
Pres: Bert C. Austin
VP: C. C. Celestre
Sec: F. Grotynski
PROVIDENCE MINE, 11 1/3 mi SE of Sonora, undergr, Au
Ideia
COPPER BLUFF MINE, Humboldt County, undergr, Cu, Au, Zn
Gen Mgr: J. MacGinnies

Mine Supt: Paul Contini
150-TON FLOT MILL, 3 mi N of Hoopa
Mill Supt: Ralph Hutchins
Asst Mill Supt: Lorraine McLennan

RASMUSSEN, FLOYD D

3521 Shields, Fresno
MALONE MINE, Mariposa County, Au, Ag

RICHTER, J. A

Callahan
MINE, Siskiyou County, Au, Ag

RICK, W. D

Gen Dal, Yreka
COLD LEAF MINE, Siskiyou County, Au, Ag

RODECKER, GEORGE

7838 Victoria Ave, Highland
HERCULES MINE, Kern County, Au, Ag

ROUP, J. C. & MCCLINCHY, ED

P. O. Box 331, Randburg
BULLDOGS GRP, San Bernardino County, Au, Ag

ROYAL URANIUM CORP

P. O. Box 1364, Palo Alto
Pres: S. D. Ackermann
VP: Aaron Richards
Sec: Peter Anderson (See Utah)

ROYER, FRANK W

Red Mt
KELLY MINE, San Bernardino County, Au, Ag

S. F. LODE MINE

1361 Chase Ave, El Cajon
SP MINE, 7 mi S of Ocotillo in Davies Valley, Imperial County (Ocotillo is on Hwy 80), undergr, open pit, WO₃ (scheelite) 3 acre outcrop
Under devel

SALMON RIVER MINES CO

Callahan
Pres & Gen Mgr: E. C. Latchem
VP: L. J. Harter
Sec-Treas: Purch Agt: W. W. Peterson
TRAIL CREEK MINE, Au, undergr

SAN GABRIEL VALLEY PLACERS

1237 S Greenwood Ave, Montebello
Own: Robert A. Riggs
MINE, 3 mi W of Azusa, placer, Au, Ag
GRAY MILL

SAN JOAQUIN DREDGING CO

468 Blakstone Ave, Fresno
MCCOAN LEASE, Madera County, Au, Ag

SANTA MARGARITA MNG CO

1450 E Ave, Selma
SANTA MARGARITA MINE, San Benito County, Hg

SCIOCHETTI, LOUIS

Box 637, Hollister
JUPITER MINE, Palmdale, undergr, open pit, Hg
Prod: 5-75 tons per day
85-TON MILL, Grissold Canyon

SEQUOIA MNG CO INC

216 Palm Ave, Imperial Beach
Pres: J. G. Kromachroeder
VP: C. E. Brunson
Sec-Treas: J. Jackson Willis
ALLIANCE MINE, Darwin, undergr, Stentile Talc
Gen Mgr: James M. Muir Jr
Ideia
(Raymond Mill to be installed Mid-1959)

SHASTA MINERALS & CHEM CO

P. O. Box 357, Redding
Pres: K. L. Stoker
VP: Harper Hunsaker
Sec-Treas: Reed L. Reeve
Asst Sec-Treas: Nancy C. Hardman
WEST SHASTA COPPER ZINC DIST MINE, Box 857, Redding, Co, Zn, S, Fe, Au, Ag

Gen Mgr: Walter C. Lawson
Asst Gen Mgr: E. E. Mallott
Mine Gen Supt: W. J. Walker, Geol
Mine Engr: Roger Patrick
Ideia

W. A. SHIFFER ASSOCIATES

3106 Pasadena Ave, Los Angeles 31
Pres: Dr. H. A. Shiffer
VP: D. Jones
Sec: A. E. Beaumont
Gen Mgr & Supt: J. H. Siepp
Purch Agt: W. Werneck
VIRGINIA-POSO MINE, Poso Creek, Pine Mt Mng dist, Kern County, placer, black sand, Co, Ti, Zr, Au
Geol: H. A. Shiffer
Mine Supt: Ed Strocher
Ideia
FLOT MILL, at mine
(See Shiffer Pacific Co. Calif, Nev, Upper Paradise Mines, Calif, & Pacific Institute, Calif.)

SILVER LAKE MNG & MLO CO

13707 Matanzas, Los Angeles
SILVER HILL MINE, San Bernardino County, Au, Ag

SISKON CORP

Box 888, Reno, Nev
Pres: H. B. Chessher Sr
VP: E. J. Schrader
Sec: J. E. Chessher
Asst Treas: A. L. Chadak
SISKON MINE, Box 148, Happy Camp, open pit, Au, Ag
Gen Supt: W. H. Chessher Jr
Pl: Frms: C. W. Cousins
Prod: 300 tons
Mill Supt: A. L. McFarland
Mill Frm: H. H. West
Mals Frm: Ralph W. Moody (See Nev)

SMITH, ALFRED T

P. O. Box 916, Fortola
MINE, Au, Ag

SONOMA QUICKSILVER MINES, INC

Box 226, Guerneville
Pres: S. R. Smith
VP: H. L. Hottle
Sec-Treas: J. W. Cook
SONOMA QUICKSILVER MINE (MT JACKSON MINE), Box 226, Guerneville, undergr, Hg
Mine Supt: Douglas Myers
Mechanic: J. L. Gail
Prod: 50 tons
100-TON MILL, at mine, rotary furnace & condensers

SOUTHERN CALIFORNIA MINERALS CO

375 So Mission Rd, Los Angeles
Own: W. K. Skoeb
Geol: Charles F. Joy
Purch Agt: Dan Tash
DEATH VALLEY AREA TALC MINES, Shoshone, talc, clay, undergr, open pit
Mine Supt: Ben Gomez
75-TON AIR FLOT MILL, Los Angeles
Mill Supt: Glen Hodges

SOUTHERN ILLINOIS MNG CO

639 S Spring, Los Angeles
Prop: H. E. Roberts
MACKEY-HUMM MINE, Rosiclare, Ill, undergr, CoP₂
Gen Mgr: A. C. Dorefield
Asst Gen Mgr: R. D. O'Brien
Gen Supt: H. C. Morrison
Mine Supt: H. J. Squire
Mine Frm: L. Austin
T. Baiford
Mine Eng: W. Fulghum
Prod: 100 tons daily
DOUGLAS MINE, Pope Co
300-TON FLOT MILL, Rosiclare, Ill, heav-med, CaP₂
Mill Supt: J. C. Shoemaker (See Ill)

SPANISH MINE

100 Palm Ave, San Rafael
Own: Louis R. Moretti
SPANISH MINE, Washington, surface, baryte
Prod: 30 tons
150-TON MILL, Florin
Mill Supt: Forrest Rhoton

SPALDING, L B

Box 18, Ramona
METAL MT MINE,
Jacumba, undergr, WO₃
Idle
LITTLE THREE MINE, Ramona,
Pegmatite minerals

SPECIMEN MINE

Bagby St, Mariposa
SPECIMEN MINE, about 1 1/4
mi NW of Bagby, undergr, Au,
Ag
Under devel

**SULPHUR MNG & SUPPLY
CO**

1891 E Glendale Blvd,
Glendale 6
Pres: Grover Kibbey
VP: J C Baldwin
Sec-Treas: J McKee
GOLDEN QUEEN SULPHUR
MINE, Inyo County, S
Idle
(See United Mercury & Oil Corp,
Utah)

**SUNSET MNG & DEVEL
CO**

Dalhousie
PAYNE'S MINE, Yuba County,
Au, Ag

SURCHASE MNG CO

3324 Broadway,
Sacramento 11
Pres: Mrs. Josephine A
Hawling
Sec-Treas: J B Cox
ATOLJA MINES, Box 27, Red
Mountain, 3 1/2 mi S of Red
Mountain on Hwy 395, surface,
undergr, WO₃
Idle

SWERON, CLARENCE C

Rt 1, Box 741B, Bonora
BLACK SLATE & ARBONA MINE,
Tuoilume County, Au, Ag

**TAYLOR-KNAPP CO, THE
CALIF DIV**

640 Moraga St, San Francisco 22
Pres: S R Knapp
VP: A V Taylor, Jr & C P
Knaebel
Sec: A C Kremer
Ch Eng: C P Knaebel

TIGHTNER MINES CO

Rm 548, 58 Sutter St,
San Francisco
Pres: Robert E McCullough
VP: W T Jenkins
Sec: Carlos S Morbin
Treas: J Malcolm Viehal
RED STAR GROUP, 1 1/2 mi N of
Allegheny, undergr, Au, Ag
Under devel
50-TON GRAY MILL,
(Leased to Endurance Mining Co)

TOTLAND BROS

Box 341, Leevining
Gen Mgr: G H Toiland
BARBARA & BKG MUGGETT
MINES, 12 mi NE of Leevining,
Au, Ag, Pb
BRIGHT STAR MINE, 8 mi W of
Conway, undergr, Au, Ag, Pb,
Bi
Under devel

TREG MNG & MLO CO

313D Princeton
China Lake
Pres: C L Green
VP & Purch Agt: R E Ralston
Sec-Treas: W H Thorpe
BILLIE BURKE MINE,
Randsburg, undergr, scheelite
PIONEER MINE,
Johannesburg, undergr, Au
25-TON GRAY MILL, Randsburg

TRI-PARTNER MINING CO

831 E Main St, Stockton
Pres: Clifton Finley
Sec-Treas & Gen Mgr: LeRoy A
Washburn
SUNNY PLACER MINE, Buena
Vista, placer, Zr, Ti, Au
WONDER QUARTZ MINE,
Grovevaland, undergr, Mn
Gen Mgr: LeRoy A Washburn
Asst Gen Mgr: Clifton Finley
Pres: Edmund Walters
ELLA MINE, Ames County,
Au, Ag

**TULARE CO TUNGSTEN
MINES**

895 Lafayette Ave, Lindsay
Ow: Dominick F Lavricella &
Sal Katoili, Jr
BIO JIM MINE, 18 mi NE of
Lindsay, undergr, WO₃
Prod: 50 tons
100-TON GRAY MILL, at mine
Idle

TWINING LABORATORIES

2327 Fresno St, P O Box
1473, Fresno 16
Ow: Fred Twining
FLOT, MAGNETIC SEPARATION,
prod-scale assaying
Met: Alex Vlau

**UNDERWOOD, HORACE V
& CATHERINE**

156 Locust Ave, Hollister
BITTER WATER QUICKSILVER
MINE, Panoche dist, SE of
Hollister, Hg
Idle

**UNITED CARBIDE
NUCLEAR CO, (DIV OF
UNITED CARBIDE CORP)**

Bishop
PINE CREEK MINE, 37 mi NW
of Bishop, undergr, surface,
WO₃, Mo
Gen Mgr: H L McKinley
Purch Agt: C A Smith
Mine Supt: L A Wright
Mine Fram: E J Birch
Eng: D J Markl
1,000-TON FLOT MILL,
Pine Creek
Supt: L E Bousa
Plant Mgr: J E Martinson
Mill Fram: H C House
(See Colo, NY, Utah, Wyo)

**UNITED MERCURY
PRODUCERS ASSOC**

44 Mesa Court, Alhambra
OLD ALMADEN PROP, Santa
Clara County, undergr & open
pit, Hg
RETORT

**U S BORAX AND
CHEMICAL CORP
PACIFIC COAST BORAX
DIV**

630 Shatto Place,
Los Angeles 5
Rm 541, 11 Gervais
VP: Hugo Rieme
VP-Gen Mgr: J F Corhill
Purch Agt: J C Walker
Sec: W A Ackerman
Asst Gen Mgr: R F Steel
MINE, Boron, open pit, borate
ores
Gen Supt: W J Duffley
Safety Eng: N W Witte
Ch Mech Eng: W D Fugit
Mine Supt: W H Wamsley
Asst Mine Supt: R E Kendall
Frm: P A Conte
Eng: F M Smith, D M Cooper
BORON REFINERY
Refin Supt: J T Young
Asst Supt: E D Lemon
(See N Mex, NY)

U S GYPSUM CO

309 W Adams St, Chicago 6
Illinois
OPEN QUARRY, Midland,
typsium
Works Mgr: R W Denke
(See Colo, Conn, Ill, Ind, Iowa,
Mass, Okla, So Dak, Tex, Utah,
Va)

**U S PUMICE SUPPLY CO
INC**

6331 Hollywood Blvd,
Los Angeles 28
Pres: Sheldon P Fay
VP: L B Clark
Sec: Leona Steinhauer
Treas: George H Lindsey
LEEVING MINE & MILL, Lee
Vining, surface, pumice stone
Gen Supt: D H Campbell
CLASS MTE MINE & MILL
Twinslake, surface, pumice stone
Gen Supt: Lynn Clark

**U S STEEL CORP
COLUMBIA-GENEVA DIV**

120 Montgomery St,
San Francisco
(See Alaska, Ala, Minn, Pa,
Tenn, Utah, Wyo)

**UPPER PARADISE MINES
ASSOC INC**

(wholly owned subsid of Pacific
Co Inc)
108 N 3rd St, Las Vegas
Pres: H A Shiffer
VP: F T Leonetti
Sec: A E Beaumont
Purch Agt: W Wernicke
VERONICA MINE, P O Box 713
Barstow, Sec 6 12 N 2 E MDS&M
Paradise Mts dist, San
Bernardino County, rare earths
Ore: H A Shiffer
Geochemist: Steve Lammie
Under devel
(See Nev, Shiffer Pac Co, Cal,
Nev, H A Shiffer Assoc, Cal,
Pac Institute, Calif)

UTAH CONSTRUCTION CO

130 Bush St, San Francisco
Pres: Allen D Christensen
Exec VP-Gen Mgr:
E W Littlefield
VP-Mgr Mng Dept: J A Mecla
Purch Agt: J B Hale
(See Utah)

VALE, H L

44 Lambuth Ave, Oakland
JUNIPER MINE, Tuolumne
County, UO₃
Under devel
MILL, Tuolumne County
Leased to Lakeview Mng Co,
Lakeview, Ore

VAN RADAR, FRED

c/o Glen Berk, 1934 Butte St,
Redding
LOYD & NORTH TRE: 46
MINES, Tehama County,
Chromite
NORTH FORK QUEEN MINE,
Shasta County, Chromite

**VANDER KERR, ROLLIN
H**

Box 783, Mariposa
GOOD GULCH MINE, Mariposa
County, Au, Ag

**VICTORVILLE LIME
ROCK CO**

Box 548, Victorville
Pres: K L Ayers
Sec-Treas: E A Piercy
VICTOR QUARRY,
open pit, limestone
Gen Mgr: E A Piercy
Gen Supt: Emil Doty
100-TON GRINDING-MILL,
Victorville
Asst Mill Supt: Perry Whittall
Mill Fram: Harold Hashiba
FURNACE CANYON MINE,
Lucerne Valley, open pit
Gen Mgr: E A Piercy
Gen Supt: Emmett Hall Jr
Genl: Robert Gessner
Under devel

WAGMANN, BERT

P O Box 195, Randsburg
WAGMANN MINE, Kern County
Au, Ag

WAN CHANG MNG CORP

137 Clarke St, Bishop
Gen Mgr: J J Strutsal, Jr
Asst Gen Mgr: Geo Reel
Purch Agt: Wm F Spain
Geol: Byron W Worha
Doug McIver
Met: Phil McGuire
Gen Supt: Bob Holmes
BLACK ROCK MINE, BENTON
DIV, undergr, WO₃
Mine Supt: Ned Philip
Prod: 600 tons
GRAY-FLOT MILL
Mill Supt: Fred Yarcho
Ill
(See Colo, Tex, & NY)

WALDEN, FRANK

Gen Del, Ft. Jones
MINE, Siskiyou County,
Chromite

WATKINS, PAUL M

Horse Creek
J D NICELY MINE, Chromite

**WATKINS, PAUL M &
FARNHAM, L**

Horse Creek
BLUE STONE KITTY HAWK,
MTH VIEW #10 MINES,
Siskiyou County, Chromite

WESTERN BARIUM CORP

110 Sutter St, San Francisco 4
Pres: J A Gorman
VP-Sec: A W Gorm-n
BARITE KING #1, 2, 3, 4, 5, 6
surface barites
(Leased to Macco Corp)
2 MILLS, Rosamond & Brown
Prod Mgr: James D Hawkins

WESTERN DEVEL CO

P O Box 1064,
Niytha
Part: R S Hall & Maurice
Willows, Jr
MINE: 19 1/2 mi NW of Niytha,
open pit
Idle

WESTERN SILICA CO

1730 Locust Ravine,
Bakersfield
SNOW WHITE MINE, 15 mi S
of Goldfield, undergr, silica
Supt: William Peterson,
Goldfield, Nev
WESTERN SILICA PLANT,
crushing & sizing plant
Mgr: Irving Feldcamp
(See Nev)

WESTERN TALC CO

1901 E Slauson Ave,
Los Angeles
Pres: F H Sewell, Sr
VP: Malcolm Stewart
WESTERN MINES, operating
on Snow Goose claim, 17 mi SE
of Tecopa, San Bernardino
County, talc
Mine Supt: Larry Lee
MILLS, Los Angeles and Dunn,
San Bernardino County
Capacity: 150 tons per day
average

WILD, BASIL

Box 342, Greenvlew
SCOTT VALLEY HOLE &
SOAD MINES, Siskiyou County,
Chromite

**WILLOW VALLEY MINES
CALIF, INC**

461 Market St, San Francisco
Pres: Lee O McCoy
VP: Lowell B Hoff
Sec-Treas: George V Pettigrew
Purch Agt: L Hanson
WILLOW VALLEY MINES,
Nevada City, undergr, Au, Ag,
WO₃
Geol: J F Siegfried
Prod: 75 tons
MILL, Nevada City
Supt: Ed O Berger
Asst Supt: G E Hiller
Under Devel

WIND WHEEL MINE

Box 151, Columbia
Own: R O Groves
MINE, undergr, Au, Ag
3 1/2-TON GRAY MILL, at mine
RETORT SMELTER, at mine

WOOD, R E

Murphy, Oreg
BEAR WALLE & CRAG CREEK
MINES, Del Norte County,
Chromite

WOODARD, JOSEPH D

2017-22nd St, Sacramento
SNIDER RANCH MINE,
Sacramento County, Au, Ag

WRIGHT, J M

Box 104, Mojave
MIDDLE BUTTES, Kern County
Au, Ag

YANKEE JOHN MINE

37 Canyon Rd, Salt Lake City,
Utah
YANKEE JOHN MINE, Shasta
County, Au, Ag

YANKEE MNG CO

800 Alhambria Blvd,
Sacramento 18
MURDOCK (LEE) PLACER,
Placer County, Au, Ag

**YUBA CONS INDUSTRIES
INC**

YUBA CONS GOLD FIELDS DIV
351 California St,
San Francisco 4
Pres: John L McGara
VP, Mgr: E J Gorman
Sec: E K Allison
Treas: W J Holcombe
MINE, Star Rt, Marysville,
placer, Au, Sn

YUBA MNG CO

2051 Santa Clara Ave, Alameda
YELLOW JACKET MINE, El
Dorado County, Au, Ag

ZINC SADDLE MNG CO

439 S 2nd St,
Springfield, Oreg
ZINC SADDLE MINE, Del Norte
County, Chromite

COLORADO

AJAX URANIUM CORP

1306 Cherokee St,
Denver 4
Pres: T J Weaver
VP: H W Woodruff
Sec-Treas: Frances K Waggener
73 CLAIMS, San Miguel County,
UO₃
Geol: T J Weaver
Under devel

ALBANO, CLAIR

Naturita
MINE, UO₃

ALLIED CHEM CORP

(GEN CHEM DIV)
40 Rector St, New York 6, NY
Pres: I H Foosee
VP: F J French
Purch Agt: W L Machmer Jr
Mgr Mng Oper: Robert H Dickson
Asst Mgr Mng Oper: Wilbert J
Trepp

BURLINGTON MINE, Box 228

Boulder, Jamestown, undergr
Ca₂
Gen Supt: James Pennington
Asst Supt: Glen E Allen
Mech Eng: A G McGowen
Mine Fram: Jack Mann
Prod: 150 tons per day
150-TON FLOT MILL, Valmont
Mill Fram: T J Hinshaw
Assayer: G Everett Allen
(See NY, Va)

ALONGO, E J

Box 234, Naturita
DIANA MINE, undergr,
UO₃, VgO₃
Prod: 10 tons per day

**ALTAMONT MNG &
URANIUM INC**

40 E 10th S, Bountiful, Utah
Gen Mgr: Geo Schmitt
MINE, near Gunnison, UO₃
Under devel
(See Utah, Nev)

AMENT & BERRY

Naturita
MINE, UO₃

AMERICAN BERYL CORP

2397 S Zenobia, Denver
MINE, pyramites

**AMERICAN GILSONITE
CO**

134 W Broadway, Salt Lake
City, Utah
Pres: E F Goodner
VP: R E Nelson
Sec-Treas: E H Owen
Asst Prod Mgr: John M Baker
COKE PLANT-REFINERY,
Glenaville
Supt: J L Boyce
Mgr: L P Morris
(See Utah)

**AMERICAN LEDUC
URANIUM**

100 N 4th, Grand Junction
HENDERSON #1 MINE
(ECONOMY CLAIMS), Outlaw
Mesa area, Mesa County, UO₃
PROPERTIES, Moffat County
UO₃

**AMERICAN METAL
CLIMAX INC**

41 Broadway, New York 6, NY
Chmn of Bd: Arthur H Bunker
Pres: Hans A Vogelstein
Sec: Erwin A Wel
Treas: Donald J Donahue
CLIMAX MOLYBDENUM CO
DIV
VP, Western Oper: Frank
Coolbaugh, Mines Park, Golden
Dir of Explor: John Curson,
Mines Park, Golden
Met: R E Culbertson, Mines

- Park, Golden
CLIMAX OPERATIONS, Climax
Res Mgr: Robert Henderson
Gen Supt: Edwin J Eitanach
Asst Gen Supt: John Petty
Geol: Stewart Wallace
Elec Eng: Urban Toucher
Ind/Fel Dir: R C Miller
Planning & Devel Eng: Max
Gelsix
MINE, undergr, Mol, WO₃,
FeS₂, Sn
Mine Supt: William Dietler
Asst Mine Supt: Jeffrey Johnson,
Charles Clueses
Mine Frnt: Tom Phillips, Bill
Holman
Prod: 34,000 tpd
(See NY)
- AMERICAN SMELTING &
REFINING CO
495 E 81st Ave,
Denver II
Mgr: J Paul Harrison
ARKANSAS VALLEY PLANT, Pb
Box 973, Leadville
Supt: L C Travis
Asst Supt: P A DeLantis
Metallurgists: M D Rood, R
Enochs, Q Cohenour, Wm Sweet
Master Mech: C Hopfinger
Chief Asst: Edward J Kelly
Safety Eng: Frank Stevens
Plant Eng: R L Armbruster
Ch Assegr: R J Elliott
Ch Chem: Max Kasten
GLOBE PLANT, Denver, Co
Supt: W L Miles, Jr
Asst Supt: Max Coates
Safety Insp: J J Ryan
(See Ariz, Calif, Idaho, Ill, Md,
Mont, Nebr, N J, N Mex,
N Y, Tx, Utah, Wash,
& Federal Mng & Smelting Co, Mo)
- AMPET CORP
323 Colorado Bldg, Denver
Pres: R A Gus Davis
VP: Robert J Paul
Sec-Treas: Alfred O Brehmer
MINE, San Miguel County, U₃O₈
Prod
(See Arizona, Utah)
- ANDRESS, CLYDE &
ASSOC
Placerville
PAYROCK MINE, Mesa County,
UV
- ANDREWS, E M & D K
Box 87, Nucla
BADGER MINE, undergr, U₃O₈
V₂O₅
JUPITER MINE, Gunnison County,
U₃O₈, Cu
Under devel
- ANSCHUTZ DRILLING CO
INC
1411 Mile High Center Bldg,
Denver
Pres: Fred B Anschutz
VP: J H Castler
Geol: Louis A Gas
Gen Supt: Fred C Hohre
AMERICAN EAGLE MINE,
Gypsum Valley, undergr, open
pit, U₃O₈
Mine Supt: W W Lyon
Prod: 20 tons
(See Utah, Wyo)
- ARAPAHOE MNG &
URANIUM ORE CORP
1027 E Amherst Ave,
Denver II
MALACHITE MINE, Jefferson
County, Cu
- ARBOGAST, H L
Rt 4, Grand Junction
U₃O₈ Prod
- ARGO MNG CO
Box 1897, Grand Junction
LOST DUTCHMAN MINE,
Beaver Mesa, Mesa County,
undergr, U₃O₈, V₂O₅
Gen Mgr: Kyle W Campbell
Mine Frnt: Willis M Rash
Prod: 70 tons
- ARGYLE MNG & MLO
CORP
870 Pearl St, Denver 2
Pres: J Cameron Grant
VP: John W Geske
Sec-Treas: Alfred O Brehmer
PRIDE, OSCEOLA &
HEMATITE MINES, Silverton,
San Juan County, Pb, Zn, Cu,
Ag, Au, Hematite, undergr,
- Gen Mgr: J Cameron Grant
Mine Supt: Barney Blackmore
Under devel
100-TON MILL, Howardsville
MILL Supt: Aldo Bonavide
- ARKO, LOUIS
Box 736, Canon City
SPIKEBUCK MINE, Fremont
County, pegmatites
- ATLAS MNG & MFG CO
409 Main St, Delta
MINE, Delta County, gypsum
- ATLAS MINING & MILL
CORP
Box 207, Grand Junction
Pres: Alan A Fisher
VP: Frank Fleming
Sec-Treas: Warren Barsham
HAWKEYE MINE, Crested Butte,
undergr, Au, Ag, Pb, Zn, Cu
Gen Mgr: Warren Barsham
Geol: Raymond C Robeck
Idle
75-TON FLOT MILL, Crested
Butte
- ATLAS URANIUM CORP
Box 326, Crested Butte
HAWKEYE MINE, Gunnison
County, Pb, Zn
- AURORA URANIUM CO
317 Main St, Grand Junction
LITTLE JONNIE MINE, Mesa
County, U V
- AUSMUS & HIGHTOWER
Naturita
U₃O₈ Prod
- AUSMUS & STAATS
Naturita
U₃O₈ Prod
- BACHELOR MINES
Dove Creek
MINE, U₃O₈
- BAIRD & SNYDER MNG CO
Dove Creek
MINE, U₃O₈
- BAKER GRAHAM
INTERESTS
P O Box 2044, Reno, Nev
MINE, U₃O₈
- BAKER & THOMPSON
Naturita
MINE, U₃O₈
- BARLEY AND CO, INC
Cripple Creek
Pres: A C Denman
VP: George F Stiner
Treas: Eugene Beagles
AEC RESERVE BLOCK 6 MINE,
Uravan, undergr, U₃O₈, V₂O₅
Idle
- BARNES, FRED
Nucla
MINE, U₃O₈
- BEAL & ASSOC
c/o Robert W Beal, Green Mt
Falls
MINE, CoF₂
- BEAVER MESA URANIUM
INC
P O Box 567, Grand Junction
Pres: Alan M Simpson
VP: Julian E Simpson
Sec-Treas: Mark Holloway
RAJAH-CHEROKEE-PACKRAT-
MARK II Gateway mng dist,
undergr, U₃O₈, V₂O₅
Gen Mgr: Alan M Simpson
Mine Supt: Henry Lehr
Asst Mng Supt: Frank Gray Beal
Prod: 200 tons
- BEE HIVE MNG CORP
Salt Lake City, Utah
MINE, U₃O₈
- BEERS, SIDNEY J
Naturita
MINE, U₃O₈
- BENTLEY, WALTER
Silverton
KITTIMAC MINE, San Juan
County, Au, Ag
- BERTOCH, B H
P O Box 65, Engat
U₃O₈ Prod
- BERYL ORES CO
c/o Michael D Lyons,
Rt 1, Box 409, Arvada
MICA GRINDER, Jefferson
County, pegmatites
- BINDER, F V
Naturita
U₃O₈ Prod
- BISHOP CANYON
URANIUM CORP
Box 2016, Hobbs, N Mex
HOGBACK MINE, Dove Creek,
undergr, U₃O₈, V₂O₅
Lessee: Bob Estes
Prod: 3 tons
- BLACK EAGLE MNG CO
Box 217, Idaho Springs
BLACK EAGLE, Clear Cr, Pb,
Zn
- BLACK GIRL MINES CO
271 N Monterey Rd,
Palm Springs, California
VP: J M McFadden
BLACK GIRL MINE, Ouray,
undergr, Ag, Cu, Pb, Au
RED MT MINE, Red Mt,
undergr, Ag, Cu, Pb, Au
Gen Mgr: J M McFadden
Geol: Dr C M Shaw
Idle
(See Calif)
- BLUE CREEK MNG CO
c/o Esther S Crane,
P O Box 296, Aztec, N Mex
U₃O₈ Prod
- BLUEBIRD MINES
Nederland
BLUEBIRD MINE, Nederland,
Boulder County, undergr, Ag,
Pb, Au, Cu
Under devel
MILL, Blackhawk
- BROWN MINES
P O Box 243, Montrose
U₃O₈ Prod
- BRYANT, THOMAS
Dove Creek
MINE, U₃O₈
- BUCKSKIN JOE MINES,
LTD
Alma
Gen Mgr: C W Jordan
PHILLIPS MINE, undergr, Au,
Ag, Cu, Pb, Zn, Fe
Idle
- BURKER & CO
P O Box 183, Naturita
U₃O₈ Prod
- BUNKER, C W & CO
Nucla
MINE, U₃O₈
- BUNKER, PHIL MNG CO
Nucla
MINE, U₃O₈
- BURNETTE, HUEY F
3500 Main St, Durango
BURNETTE #5 MINE, Long
Park Area, Montrose County,
undergr, U₃O₈, V₂O₅
Gen Mgr: Grant H Huntley
Mine Frnt: Paul P Paverjon
Prod: 30 tons
(Lessee from Vanadium Corp
of Amer)
- BURWELL MNG CO
Dove Creek
MINE, U₃O₈
- CADWELL MNG CO
c/o Vernon I. Phillips,
2450 Kendall St, Denver 15
HAYDEN SHAFT, Ag, Pb, Zn
Idle
- CAMP BIRD COLO INC
Suite 2110, 1st National
Bank Bldg, Denver 2
Pres: C Maxwell Norman
VP: C P Tremellett
Sec: D C Downes
CAMP BIRD MINE, Ouray, Pb,
Zn, Cu, Au, Ag
Geol: C Bruce
Mech Eng: John Ives
Eng: H Loeschel
Mine Frnt: H Bartlett
Mine Eng: R Bonatti
Under devel
(See NY)
- CAMPBELL & CLOSSER
Box 573, Montrose
MINE, U₃O₈
- CAMPBELL, JESS
Redvale
MINE, U₃O₈
- CANFIELD, ARTHUR
P O Box 84, Dove Creek
U₃O₈ Prod
- CANFIELD & PARENT
Grand Junction
MINE, U₃O₈
- WM J CAREY MNG CO
824 Road Ave, Grand
Junction
Pres: William J Carey
Mgr: Harry E Maynes
Dist Geol: Delf W Fieldman
NASCROY MINE, Monument
Valley, Ariz, undergr, U₃O₈
Under devel
Leased-Climax Uranium Co
(See Ariz)
- CHAMPION MINES CO
1742 Sherman St, Denver 3
Pres: Jack H Smith
VP: R Reglin
Sec: D F McDermott
MORNING STAR & LAST
CHANCE MINES
LEASES ON JERRY JOHNSON,
WPH & FOREST QUEEN MINES,
Cripple Creek, undergr, Au
Idle
- CHAPIN, LOUIS A
Placerville
MINE, U₃O₈
- CHEROKEE MINES
231 S Grant Ave, Ft Collins
Pres: T H Sackett
VP: V E Cram
Sec-Treas: Jas H Andrews
BLACK HAWK #1 & 2 MINES
undergr, U₃O₈
Gen Mgr: T H Sackett
Idle
- CLEAR CREEK MNG CO
1727 Boulder St, Denver II
Pres: Donald F Farris
VP: Alfred G Hoyt
Sec: Erl H Ellis
LAKE CENTRAL MINE, Idaho
Springs
Mine operated by: Contract
Engineering Co
Under devel
Mine Supt: Simon Fillmore
Peavay III
- CLIMAX MOLYBDENUM
CO DIV (SEE AMERICAN
METAL CLIMAX, INC,
COLO, N Y)
- CLIMAX URANIUM CO,
(SUSSID OF AMERICAN
METAL CLIMAX INC)
Box 1901, Grand Junction
Pres: Frank Coolbaugh
VP & Gen Mgr: A M Mastro-
vich
Purch Agt: L J Mann
Consult: E J Duggan
Asst Treas: A R Eikenberry
Asst Sec: T E Congdon
MINES, near Grand Junction,
undergr, U₃O₈, V₂O₅
Mgr Mines: L J Brewer
Prod Supt: T E McCandless
Prod: Andy O Korn, E D Bieker,
E A Roberts
Ch Geol: Philip Donnerstag
Geol: R P Darnell, J C Moore,
Robert Nakasaka, Wayne
Roberts, Roland Warner
CHEM MILL, Grand Junction
Plant Mgr: R C Toerper
Mill Supt: Paul Wire
Master Mech: G K Burnhart
Ch Met: R E Musgrove
Ch Chem: Q S Kocher
(See Ariz, N Y, Utah)
- COCHRAN URAN CO
Rt 2, Grand Junction
MINE, U₃O₈
- COO MINERALS CORP
Denver Club Bldg, Denver
Pres: W C Norman
VP: J H Nason
Sec: C W McDermott
Treas: D F Taylor
Oper Mgr: Frank A Seeton
(See California, Utah)
- COLE, JOE
Naturita
MINE, U₃O₈
- COLE MITCHELL
& WHITE
La Sal, Utah
MINE, in Colorado, U₃O₈
- COLO AGGREGATES CO,
INC
Mesa
Pres: Geo M Oringdolph
VP: W W McClintock
Sec: Henry Quiller
MESITA HILL MINE, 2 mi W of
Mesa, surface, volcanic
scoria,
Gen Mgr: Geo M Oringdolph
Frm: Robert Compton
Prod: 300 tons
- COLORADO BERYLLIUM
CORP
Suite 35, 155 N College Ave,
Fort Collins
Pres: John M Phillips
VP: Hon Thomas P Brady
Sec-Treas: Lloyd J Sisson
COLORADO BERYLLIUM
CORP MINE, Crystal Mt area,
30 mi SW of Fort Collins, Miss,
Feldspar, Be
Gen Mgr: John M Phillips
Gen Supt: Charles Stafford
Geol: Warren E Hofstra
Under devel
- COLO FUEL &
IRON CORP
Continental Oil Bldg, Denver
Pres: A F Franz
Sec: D C McGraw
Treas: H C Croot
MINING DEPT, Box 316, Pueblo
VP, Oper: J J Martin
Dir, Purch: L C Rose
Mgr, Mines: R R Williams, Jr
Ch Eng: Mag Dept: W J Schenier
Ch Geol: D A Carter
Ch Elec: J W Irwin, Trinidad
MONARCH QUARRY, limestone,
Salida
Supt: J E Whitney
Prod: 3000 tons
CANON DOLOMITE QUARRY,
Canon City
Supt: E C Jagow
Prod: 325 tons
(See Utah, Wyo)
- COLO PLATEAU
URANIUM CO
824 Equitable Bldg, Denver
COLONEL SELLERS, Summit,
Pb, Zn
- "COMIN CO" CO-
OPERATIVE MNG CO LTD
P O Box 317, Dove Creek
Pres: Gregory E Shoels
Sec-Treas-Purch Agt: Hal C
Shoels
"COMIN CO" COPPER MINE NO
1, Wet Mt Valley, Slick Rock
Mng dist, Cu
Gen Mgr: Hal C Shoels
Prod: 100 tons per month
Idle
"COMIN CO" COPPER MINE NO
2, Paradox Valley, undergr, Cu,
Ag
Gen Mgr-Mng Eng: Hal C Shoels
Asst Gen Mgr: W D Trip
Gen Supt: James E Beck
Mech Eng: Preston D Baker
Prod: 30 tons per day
Under devel
- CONTINENTAL MATER-
IALS CORP (FORMERLY
CONTINENTAL URANIUM,
INC)
820 Ninth St S, Grand Junction
Pres: Willard Gidwitz
Sec: Max H Braun
Ch Chem: Gerald Gidwitz
Gen Supt: C H Reynolds
Under devel
(See Utah, Wyo)
- CONTINENTAL MINERAL
RESOURCES INC
Box 455, Salida
MINE, Chaffee County, CaF₂
- COOLEY GRAVEL
COMPANY
c/o D G Hughes, Sec,
6101 Lowell Blvd, Denver
COOLEY GRAVEL PIT, Adams
County, Au, Ag

Colorado

COPELAND, THOS A & KNIGHT, JAMES A
318 E 9th, Hinsdale, Ill
EL PASO GROUP, et al
CRIPPLE CREEK, Teller County

CORDILLERA CORP
311 Seaboard Bldg, Seattle 1, Wash
LEMO GRP, Park, Summit, Pa, Zn

COSTELLO LEASE
Bonanza Rd, Villa Grove
Op: W J Costello
RAWLEY MINE, Bonanza, 20 mi NW of Villa Grove, undergr, Pb, Zn, Ag, Cu
Prod: 35 tons

COTTER CORP
P O Box 781, Canon City
Pres: Parker Wilson
VP: David F Marzotti
Sec-Treas: R J Gaskin
Purch Agt: Leo L Kaveny
MINE, U₃O₈, Th
Gen Mgr: David P Marzotti
Under devel

71-TON CARBONATE LEACH URANIUM MILL
Mill Supt: Glen E Hanson
Mill Frnt: Guy Winslow
Assayer: Myles Pimmans

COUCH & TRONE
Naturita
U₃O₈ Prod

CRESSON CONSOL GOLD MNG & MLO CO
P O Box 88,
Colorado Springs

Pres: Merrill E Shoup
VP & Gen Mgr: Max W Bowen
Sec: Max Bates
Treas: John Jacobs, Jr
CRESSON MINE, undergr, Au
Asst Gen Mgr: George Murray
Gen Supt: C H Carlton
Mech Eng: George Lorenz
Purch Agt: H L Stone
Mine Supt: W B Johnson
Prod: 75 tons daily

CULLEN MINERALS CORP
310 Road Ave,
Grand Junction
Pres: Lucien R Cullen
VP: K D Kazian
Sec-Treas: T N Tucker
(See Utah)

CYPRUS MINES CORP
553 W 5th St,
Los Angeles 14, California
URANIUM CLAIMS
(See Ariz, Calif)

D & J URANIUM & EXP-LO-CO INC
319 Box D-rant Bldg, Pueblo
Pres: Russell L Jewett
Sec: Chas M Warner
Treas: Seamon A Jewett
Dir: Glenn A Sanders
Sales Mgr: George J Schmitt
BONITA MINE, Pueblo, undergr, U₃O₈
Eng: Walter Burleson
Under devel

W L DAVENPORT & DR F P GROSS, (Operator)
Box 193, Breckenridge,
MINNIE MINE, 3 mi E of Breckenridge, Summit County, Au, Ag, Pb, Zn
Idle

DAVIS & GOFORTH
Dove Creek
MINE, U₃O₈

DEADWOOD LEASING CO
Cripple Creek
FREE COINAGE, Teller, Au, Ag

DEAL MINING COMPANY INC
Box 292, Ft Collins
Pres: Arthur G Wyhart
VP: Melvin A Wyhart
Sec-Treas-Purch Agt: Frank G Hooper
JODY MINE, Blue Mesa
Ming dist nr Uravan, undergr open pit, U₃O₈, V₂O₅
Mine Supt: Melvin A Wyhart
Asst Mine Supt: Arthur G Wyhart

DENVER-GOLDEN OIL & URANIUM CO
760 Denver Club Bldg, Denver
Pres: Charles O Parker
VP: G N Brodie
Sec: Roy O Goldin
Treas: Barney Janow
SCHWARTZ-WALDER MINE
Raisin Creek, Box 109,
Golden, Jefferson County, U₃O₈
Mine Mgr: E C Rice
Asst Mine Mgr: Clyde I Tree

DILLON, RICHARD
Box 1382, Cortes,
U₃O₈ Prod

DIVERSIFIED RESOURCES INC
200 N 5th, Grand Junction
PROPERTIES, Gateway Mag
dist, Mesa County
Under devel

DOCTOR JACK POT MNG CO
Box 127, Cripple Creek
DOCTOR JACK POT MINE,
Teller, Au, Ag

DODGE, JAMES S
Aspen
MINE, U₃O₈

DOEPKE MNG CO
2431 N Nevada Ave,
Colorado Springs
Mgr: Frank D Doepke
GOLD KING, LEXINGTON, & MATTIE L MINES, Teller County, Au
Under devel

DOUBLE JACK MNG CO
P O Box 133, Nuclea
MINE, U₃O₈

DOYLE URANIUM CORP
Box 1421 Colorado Springs
Pres: M K Doyle
VP: J D Stone
Sec-Treas: E G Untiedt
PITCH PORK MINE, Naturita
Gen Supt: Jim Galyean
Geol: Cleo Ransom
Undergr U₃O₈ Prod

DRILLCO MNG CO
Escalante, Utah
MINE, in Colorado, U₃O₈

DULANEY MNG CO
312 First Nat'l Bank Bldg
Grand Junction
Pres: R O Dulaney
VP: C H Dulaney, Harry B Friedman & F H MacPherson
Purch Agt: Robert B Burns
Gen Mgr: Frank H MacPherson
Gen Supt: Leroy Hemphill
Geol: Philip P Powers
Mech Eng: Alvin Zunic
RADIUM GROUP OPER, 21 mi N of Dove Creek, undergr, U₃O₈, V₂O₅
Prod: 80 tons

D L DUNCAN MNG CO
P O Box 92, Dove Creek

EAST RIDGE CO
Box 558, Ouray
Pres: Carlton E Byrne
VP: F Moldenauer
Sec: Alice Davenport
ANDRUS MINE, 14 mi NW of Silverton, undergr, Zn, Pb, Cu, Ag, Au
Gen Mgr: Philip V Doyle
(See Calif)

ECKMAN, W B
Naturita
U₃O₈ Prod

EGGERS, C F
Dove Creek
DOLORES APRIL MINE,
Slickrock dist, San Miguel County, undergr,
Prod: 10 tons

ELKTON GOLD MNG CO
Box 127, Cripple Creek
ELKTON GROUP, Teller, Au, Ag

EMPERUS MNG CO
Empertus Bldg, Creede
Pres: T B Posson
Treas: H B Hayden
Gen Mgr: B T Posson
EMPERUS MINE (ROBINSON & AMETHYST), 11 1/2 mi N of Creede,

undergr, Pb, Zn, Ag, Au
Mine Supt: T B Posson
Mine Frnt: T J Phillips
Prod: 80 tons
150-TON PLOT MILL, 1 mi S of Creede
Mill Supt: T B Posson
Mill Frnt: H S Wheeler
Assay: Gordon Hosselino

EMPIRE LEE MNG CO
Box 127, Cripple Creek
HABELLE MINE, Teller, Au, Ag

ENGLISH, TONY
Naturita
MINE, U₃O₈

EQUITABLE URANIUM CORP
727 Cooper Bldg, Denver
Pres: Melvin C Bowles
VP: A L Hollin
Sec: Glenn C Leander, Jr
GOVERNOR MINE & CLAIMS, Box 352, Bishop Canyon,
Slick Rock Mag dist, undergr, U₃O₈, V₂O₅
Gen Mgr: Melvin C Bowles
Supt: Vernon K Dowles

ETA MINES
317 Main, Grand Junction
Part: Frank L Seymour, Vernon Pick & Jim Martin
RAE MARIE MINE, 10 mi W of Gateway, undergr
Mine Supt: James F Martin
Under devel

EUREKA TUNGSTEN CO
3555 S Cherokee St, Englewood
Part: John S Kellner, E B Ralston
EUREKA MINE, Sugar Leaf mag dist, Boulder County, undergr, WQ
Gen Mgr: E B Ralston
Idle

FEDEL, F V
Box 473, Uravan
LONG PARK & MINE, Long Park
Ming Dist, undergr, U₃O₈

FIBREBOARD PAPER PROD CORP
(Pabco Bldg Materials Div)
P O Box 259, Florence
COALDALE QUARRY, Florence, open pit, gypsum rock
Mine Supt: T E Barton
Prod: 250 tons per day
(See Calif, Nev)

FINCHER, OTIS
624 Pine St, Grand Junction
RODNEY #1 MINE, Mesa County, U, V

FLANDERS MNG CO
(See Pacific Industries, Inc)

FLEXORE INC
Westcliffe
MINE, Cripple County, Perlite

JOBIE K FOLSON MNG & MLO CO, LTD
4280A Holly Ave, St Louis 15, Missouri
Pres: Oscar F Hoegal
Sec-Treas & Purch Agt: Fred W Kublin
Idle

JOSIE K FOLSON MINE
Saguache County, undergr, Au, Ag
Gen Mgr: Fred W Kublin
Idle

FORGE HILL MINES INC
Box 424, Idaho Springs
Pres: Walter R Smith
VP: C E Morrison
Sec-Treas: Wilfred Roberts
FAIRMONT & FAIRMONT EXT: Russell Gulch, undergr, Pb, Ag, Cu, Zn, Au
Mine Supt: C E Morrison
Under devel

FOSTER, HERBERT
1217 Colorado Ave, Grand Junction
U₃O₈ Prod

FOSTER, RALPH
1217 Colorado Ave, Grand Junction
SNOWSHOE, MESA #5

FOUR CORNERS URANIUM CORP
320 Mile High Center, Denver
Pres & Gen Mgr: E H Sanders

VP: E L Clark, A G Rydstrom
Sec-Treas: Taft Barrow
Cons Eng: C R Willey
Mng Eng: James Baldwin
LYON CREEK & GREEN RIVER MINES, La Sal Canyon dist, (Mall: La Sal, Utah)
U₃O₈, V₂O₅
Gen Supt: Walter R Bromson
BULL CANYON GROUP (S), Bull Canyon dist
Gen Supt: Joseph N Trudgemon
PALLAORO MINE, Morrison
Idle
(See Utah, Wyo and Largo Uranium Corp, N Mex)

FOUR STAR EXPL CO INC
823 N 4th St, Canon City
MINE, U₃O₈

FREELAND EXTENSION
1253
Box 721, Idaho Springs
Pres-Treas-Own: Eva A Lear
Purch Agt-Own: Frank Lear
FREELAND EXTENSION 1253, Trail Creek, undergr, Au, Ag, Cu, Pb
Idle

FREMONT MINERALS INC
Farmers Union Bldg, Denver
Pres: J P Lannon
Exec VP: Allen D Gray
Sec-Treas: W H Hodley
Prod Mgr: G T Bator
Purch Agt: P M Cheney
Met Consultant: H L Hazen
(See Wyo)

FRONT RANGE MINES, INC
Burns Vault Bldg, Denver
Pres & Gen Mgr: John Deerkson
VP: Paul R Spencer,
Robt S Minnelli
Sec-Treas: H P Macaulay
MATTIE MINE, Clear Creek County, Pb, Au, Ag,
Idle
MELVINA MINE, Boulder County, Au
Idle
STRONG & MARY CASHIER MINES
Teller County, Au
KING SOLOMON GROUP
Idle
CLEAR CREEK MILL, Dumont
Dist
Capacity: 200 tons

FRONTIER MNG CORP
130 W M in St
Grand Junction
U₃O₈ Prod

FURMAN G O
Box 734, Salida
BARUM GRP, Gunnison County, Mn

G B L COMPANY
312 Emporia St, Aurora 8
Pres: F Vernon Griffith Jr
VP-Purch Agt & P Lancy
Sec-Treas: John P Lake
FRIENDS FRIEND & GEM
LODE Idaho Springs undergr
Au, Ag, Pb, Cu
Gen Mgr-Mine Supt: A P Lancy
Gen Supt-Assl Mine Supt: George Prime
Geol: Paul Bonham
Mine Frnt: Paul Bonham
Mine Eng: M T Biggs
Prod: 20 tons
(See Mo)

GADDIS MNG CO
1500 Mile High Center, Denver
Pres: W H Gaddis
VP: Loren E Smith,
Kenneth K Baker
ELK PARK MINE, Silverton, San Juan County, undergr, U₃O₈
Under devel

GARDNER & CO
P O Box 252, Naturita
U₃O₈ Prod

GARY, GEORGE L
6300 Acacia Ave, Oakland, California
MINE, U₃O₈

GAYNO MNG CO
730 N 3rd St, Montrose
U₃O₈ Prod

GIANT CYCLE CORP
Box 86, Carlton Bldg,
Colorado Springs
Pres: Merrill E Shoup
Exec VP & Gen Mgr: Max W Bowen
Asst Gen Mgr: O Murray
Sec: H Bates
Treas: John Jacobs, Jr
Under devel
(See S D)

GLOBE HILL MNG CO
2254 Independence Bldg,
Colorado Springs
Pres: H J Anderson
VP: R W Beal
Sec-Treas: R B Murray
Asst Secy: Julia Davison
PHONOLITE MOUNTAIN URANIUM MINE, Cripple Creek, open pit, U₃O₈, Autonite
Asst Gen Mgr: Stan Ratzliff
Gen Supt: George West
Geol: T W Anderson
Mech Eng: Lloyd Collard
Asst Mine Supt: L D Anderson
Mine Frnt: Earl Robush

GLOBE MNG CO (Unit of Union Carbide Corp)
Grand Junction, Box 1049
(See Wyo)

GOLD ANCHOR MINERALS INC
c/o Doug Watrous, Box 444,
Idaho Springs
GOLD ANCHOR MINE,
Clear Creek, Au, Ag

GOLDEN AGE URANIUM CORP
Jamestown
MINE, Gilpin, Au, Ag

GOLDEN CYCLE CORP
P O Box 89, Carlton Bldg,
Colorado Springs
Pres: Merrill E Shoup
Exec VP & Gen Mgr: Max W Bowen
Asst Gen Mgr: G Murray
Treas: John Jacobs, Jr
Sec: H Bates
Mines Mgr: Charles Carlton
Purch Agt: Howard Stone
AJAX MINE, Cripple Creek, Au
Supt: H Barnett
1,000-TON PLOT-CYAN MILL (Carlton Mill), at mine
Supt: Wm Klein
URANIUM DIVISION MINE, Aikman
Mesa near Uravan
Supt: T J Ballard
MINE, Maryvale
(See Utah)

GOLDSWORTHY, DAVID
Montrose
MINE, U₃O₈

GOODE TRUMAN
Naturita
MINE, U₃O₈

GREAT LAKES CARBON CORP
Hastin
Mng & Mineral Products Div,
Perlite Department
(See Calif, Nev, N Mex, Oreg)

GREAT WESTERN AGGREGATES, INC
806 Boston Bldg, Denver
Op: Ernest W Munroe
GOODWIN QUARRY, surface, gypsum

GREEN RIVER OIL & URANIUM CO
25 W Broadway #1
Salt Lake City, Utah
Pres: Fallas M Kelly
Sec-Treas-Purch Agt: Austin B Smith

VANADIUM QUEEN PROPERTIES
San Miguel County, undergr, U₃O₈

HAL, BART, EAGLE, SMOAL GROUP, Gas Hills area, Fremont County, Wyo

VANADIUM QUEEN MINE, Gas Hills area
Leased to Ed Hall, Grand Junction, mng oper by Lucky Mc Uranium
(See Wyo, Utah)

GREENLEE, W G
Cortes
U₃O₈ Prod

GRIFE, ROY

Naturita
MINE, U₃O₈

GRIFE, WOODROW E
(Lessor)

Box 225, Naturita
EARLY MORN, Big Oyp Valley,
undergr, V₂O₅, U₃O₈
Prod: 1 ton
WALLEYS CLAIM, Siskrock
dist, V₂O₅, U₃O₈
Prod: 10 tons

GUNNISON MINING CO

Box 539, Gunnison
Pres: Vance Thornburg
VP: Dr Garth W Thornburg
Sec-Treas: Duffy Salinger
Purch Agt: William R Johnson
LOS OCHOS MINE, approx 23 mi
SE Gunnison, undergr, U₃O₈
Mine Supt: Leslie C Ross
Geol: Coy M Mobley
Asst Mine Supt: F D Foklich
Mine Frnt: William R Oresau
Mine Engr: James V Coan
Prod: 400 tons daily
400-TON SOLVENT EXTR MILL,
approx 1 1/3 mi SW Gunnison,
U₃O₈
Mill Supt: R E Shreve
Mill Frnt: F D Jackson
Transp Supt: John Trumbo
Maint Supt: Robert A Rule
Ch Chem: Earl Young
Sec to Pres: Pat Talia
LAST CHANCE MINE,
331 N 5th, Canon City,
open pit, U₃O₈
Gen Mgr & Geol: Jack Pursley
Prod: 30 tons daily

HENNINGSON, SMITH &

RUGG
Nederland
LONG SHOT, Boulder County,
WO₂

HETZEL, LEE

Cliffian
U₃O₈ Prod

HIDDEN SPLENDOR MNG

CO, THE
315 N 5th, Grand Junction
(See Utah)

HOLLAND, REX

Naturita
MINE, U₃O₈

HOLLING, HENRY

P O Box 7, Egner
U₃O₈ Prod

HOLT, HARVEY

Blanding, Utah
U₃O₈ Prod

HORN & BURGER

Breckenridge
WELLINGTON GRP, Summit,
Pb, Zn

J M HUBER CORP

P O Box 531, Borger, Texas
U₃O₈ Prod

HUGHES, C J

Moab, Utah
MINE, in Colorado, U₃O₈

HUMPHREYS GOLD CORP

910 1st Nat'l Bank Bldg,
Denver 3
Pres: A E Humphreys
VP: I B Humphreys
VP: Jay P Wood (Jacksonville,
Fla)
Sec: W T Hostetter
(See Fla)

IBEX URANIUM INC

P O Box 550, Montrose
Pres: Theodore L Brooks
VP: Jack R Cagle
Sec-Treas: Stewart C Lee
Geol: Max A Krey
MINES & CLAIMS, Montrose &
San Miguel Counties, undergr,
U₃O₈
Under devel

IDARADO MNG CO

Ourray
Pres: M D Banghart
IDARADO MINES, 12 mi SW of
Ourray on Red Mt & TELLURIDE
MINES at Pandora, undergr, Cu,
Pb, Zn
Gen Mgr: John S Wise
Gen Supt: A C Hlander
Mine Supt: John Kearney

Ch Clerk: Geo C Forbes

Mech Supt: W L Griffiths
Ch Eng: Jack C Keenan
Prod: 1,800 tons
FLOT MILL, Pandora
Supt: M A Jorgensen
Capacity: 40,000 tons ore per mo
(See Newmont Mng Co, NY)

INLAND DEVEL CORP

3075 E 50th Ave, Denver 18
Pres: E M Stuna
VP: H S Dickson
Sec: C H Launer
Treas: Jas B McDonald
BILL & BUD MINE, Coaldale,
open pit, U₃O₈
Mine Supt: Wm B Harvey
Asst Mine Supt: Wm Ogden
Under devel

INTERNAT'L MINERALS &

CHEMICAL CORP
CONSOL FELDSPAR DEPT
Old Orchard Rd, Skokie, Ill
FELDSPAR MILL, Denver
Gen Supt: L W Comer
Prod: 100 tons daily
MICA PLANT, Pueblo, dry
grinding
Gen Supt: C M McDaniel
(See Ariz, Fla, Ill, Me, Miss,
N Mex, N C, S D, Tenn, Va, Wyo)

IRON SPRINGS PLACER

1634 Canon Ave, Grand
Junction
Own: Boyd Robinson
IRON SPRING PLACER MINE,
Ophir, surface, Fe₂O₃
Prod: 10 tons

ISABELL, LESLIE A &

SON
633 Whipple St, Canon City
TEXAS CREEK RIDGE VIEW
STRIP, Fremont County,
Pegmatites

JACKPOT OIL CO

Travel Center Bldg,
1640 Court Place, Denver 2
Pres: Paul R Clark
VP: Gordon Clark
Sec-Treas: A M Biderman
BALD EAGLE MINE, Idaho
Springs, undergr, Au, Ag, Pb, Cu
Gen Mgr: Paul R Clark
Mine Supt: Roy Walcott
Prod: 30 tons
125-TON FLOT MILL,
Idaho Springs
Mill Supt: Charles Quinn

JARMAN & HADDEN

P O Box 383, Cortes
U₃O₈ Prod

JONES LEAD & ZINC

MINES CO
Box 921, Leadville
Own: Robert L Jones
GARIBOLDI MINE, 2 mi E of
Leadville, undergr, Pb, Zn, Au,
Ag
Idle

JONES, MYRON L &

PAUL R
Box 574, Rico
ST LOUIS & IRON CLAD,
Dolores County, Au, Ag

JOSEPH, ED

Norwood
U₃O₈ Prod

ROY KAMHOLZ MNG

Egnar
CHARLES T₂, T₄ MINES,
undergr, U₃O₈, V₂O₅

KELLY, MARK

Naturita
U₃O₈ Prod

KENDRICK BAY MNG CO

Mines Park, Golden
Pres: Frank Coolbaugh
VP: Ernest Jones
Horace A Sawyer, Jr
Sec: John P Pitts-Gibson
Treas: Thomas E Congdon
(See Alaska)

KERKLING & SLENSKER

1800 Dover St, Lakewood
BRANNAN PIT NO 8, 10,
F S RIZZUTO GRAVEL PIT,
INLAND S & G MINE, Adams
County, Au, Ag
W P KERKLING PLACER,
Jefferson County, Au, Ag

KERR-MCGEE OIL

INDUSTRIES, INC
Rt 1, Box 298A,
5830 McIntyre Rd, Golden
RESEARCH LABORATORY
Mgr: Mineral Devel & Research:
V L Mattson
(See Ariz, N Mex, Okla, Wyo &
Kermac Nuclear Fuels, N Mex)

KING, ROSS & FRITZ,

DONALD
Castle Rock
THREE MUSKETEERS MINE,
Douglas County, Pegmatites

KLEINKNECHT, EUGENE

Box 50, Hartree
BEAR CAT, MORNING STAR
MINES, Park County, Ca₂

KOSTELIC, LOUIS

LESSEE
205 W 3rd St, Leadville
BI-METALLIC MINE, undergr
Gen Mgr: Louis Kostelic
Prod: 4 tons per day
20-TON-GRAB-MILL
Mill Supt: Louis Kostelic
Assayer: W H Smith

LABRUM, THERMER R

Uranian
MINE, U₃O₈

LA SALLE MNG CO

Box 217, Grand Junction
Part: M M Hardin, Roy M Eidal,
J R Rummel, M P Rowe
CLUB MESA MINE, undergr,
U₃O₈, V₂O₅, Uranian
Co-Mgrs: M P Rowe, G T Rummel
Under devel
UNDEVEL MNG PROP, various
parts of Colo
(See Utah)

LAMBERG, GLENN &

SONS
Box 108, Salida
SILVER ROCKER GROUP,
Pegmatites

LAMBERTSON, JOHN

Box 587, Gunnison
STAR MINE GROUP, 55 mi N of
Gunnison, undergr, Pb, Ag

LEADVILLE LEAD CORP

410 Colorado Bldg, Denver
Pres: Robert G Risk
VP: Harvey Tedrow
Sec: Byron White
Treas: Kenneth Miller
Gen Mgr: James Tiffany
HILLTOP MINES, Fairplay,
undergr, Pb, Zn, Ag, Cu
Under devel

LEE, ELDER

Nuclea
MINE, U₃O₈

LEE & SMALL MNG

P O Box 550, 431 Main St,
Montrose
Stewart C Lee, U A Small,
135 S 3rd St W, American Fork,
Utah
Mine Eng: Max Krey
MINES & CLAIMS, Montrose &
San Miguel Counties, undergr,
U₃O₈
Under devel

H N LEE SAND & GRAVEL

CO
Deliver
LEE SAND & GRAVEL PIT
Jefferson County, Placer
Au, Ag

LEHR, VERNON

Gateway
MINE, Calamity Mesa, 17 mi E
of Gateway on Uncompahgre
Plateau, U₃O₈

LISBON URANIUM CORP

2808 Hwy 50, Grand Junction
GATEWAY PROPERTIES,
Beaver Mesa, U₃O₈
Contractor: Charles V Woodward
Prod: 750 tons per mo
(See Mont, N Mex, Utah, Wyo)

LLOYD, MERLE D

Egnar, Colo
MINE, U₃O₈

LOWE CORP

316 Paramount Bldg,
Denver 2
Pres: J E Spaulding
VP: R L Manning
Sec-Treas: J R Moran
Geol: D C Sargent
Under devel
(See Wyo)

LOST CANYON URANIUM

& OIL CO
224 First Nat'l Bank Bldg
Albuquerque, N Mex
LOUISE & KATHRYN MINES,
undergr
Idle
(See N Mex)

LUCAS MNG CO

La Porte
MICA RIDGE MINE NO 1,
Pegmatites

LYNN, LEONARD P

P O Box 141, Nuclea
MINE, U₃O₈

M & S INC

Salida
Pres: J W Magnuson
Gen Mgr: R H Magnuson
HOMESTAKE MINE, surface,
feldspar

MARCY-SHENANDOAN

CORP
Jarvis Bldg, Durango
Pres & Genl Mgr: S S Tomlin, Jr
VP & Geol: E M Barge
Sec: R M Schell
Treas: R B Goodgrass
GARRY OWN MINE, Silverton,
undergr, Pb, Zn, Au, Ag, Cu
Idle
SILVER LAKE MINES, Silverton,
undergr, Pb, Zn, Au, Ag, Cu
MDe Supt: John Holmgren
Mech Eng: Roy Green
Under devel
CEDAR POINT MINE, Beaver
Mesa, undergr, U₃O₈, V₂O₅
Mine Supt: Glen Green
Asst Mine Supt: Fred Feasle
Prod: 10 tons daily
700-TON FLOT MILL, Silverton
(See Ariz, Utah)

MARY MURPHY GOLD MNG

CO
Box 208, Salida
Gen Mgr: W E Burleson
Res Mgr: H Van Aken
MINE, 4 mi SW of St Elmo,
undergr, Au, Ag, Pb, Zn
Frm: Henry Carey
Idle
(Leased to W E Burleson)

MAUPIN, ED

Nuclea
U₃O₈ Prod

MAYFIELD, JERRY

P O Box 251, Naturita
U₃O₈ Prod

MAYFIELD, PAGE &

NEILSON
P O Box 22, Delta
U₃O₈ Prod

MAYFLOWER-MNG &

PETROLEUM CO

Box 531, Ourray
Pres: H J Evans
VP & Pres of Board: Z C Colt
Sec: A A Trussell
Treas: S C Colt, Jr
MOUNTAIN KING & CAMP BIRD
EXTENSION MINES, Ourray, Pb,
Zn, Cu, Au, undergr
Gen Mgr: Keith P Johnson
Geol: E W Hinchard

McALESTER FUEL CO

P O Box 783, 306 E Wyandotte,
McAlester, Oklahoma
Pres: J G Paterbaugh
VP & Gen Mgr: Tom E Garrard
Sec-Treas: Carl Oman
Geol & Mine Eng: Robert Ford
(P O Box 428, Riverton)
MEEKER MINE, open pit,
U₃O₈, V₂O₅
Gen Supt: Ralph Hawks

McFILLAN, GUY A

2204 Mapleton, Boulder
SUNNYSIDE & FITZ NO 1,
Boulder County, WO₂

McKEE, JIM

Box 535, Santa Fe, N Mex
EXCHANGE LOSE MNG CLMS,
Sapache County, Mo
WOLF CLM, San Miguel County,
Mo

MENA MNG CO

4025 Montview Blvd, Denver 7
Pres-Gen Mgr: J W Walsh
VP: M W Walsh
Sec & Treas: Paul L Schmitts
MENA MINE, Golden, Jefferson
County, undergr, U₃O₈, Cu, Ag,
Au
Mine Supt: Lee E Babcock
Under devel

MICRO COPPER CORP

Marshall Court, Moab, Utah
Pres: Richard N Mohler
Sec-Treas: Ellis R Cook, Jr
ALLEN #2 MINE, Red Canyon,
San Juan County, Utah, U₃O₈,
V₂O₅, undergr
QUARELL, PATTY, SUNRISE,
PICKETT CORRAL MINES,
Bull Canyon, Montrose, U₃O₈,
V₂O₅, undergr
RED ROCK, WILD CAT MINES,
Martin Mesa, Montrose, Colorado
City, U₃O₈, V₂O₅, undergr
Gen Supt: Everett Blackburn,
Placerville
Prod: 25 tons
Under devel
(See Utah)

MID-CONTINENT
URANIUM CORP

Uranium Center Bldg, Grand
Junction
Pres: D Lew Williams
VP & Gen Mgr: Norman E Ebbles
Sec-Treas: Mark D Dunn
Purch Agt: John E Danielson
(See Utah)

MILLER, M E

P O Box 17, Placerville
U₃O₈ Prod

MINERALS PROD CO OF
CALIF

1809 Bayshore Highway,
Burlingame, Calif
Pres: George S Keyman Jr
VP: H H Van Aken
Sec-Treas: David H Keyman
MARY MURPHY MINE, Rumley,
undergr, Pb, Zn
Gen Mgr: H H Van Aken
Idle
(See Calif)

MINES DEVELOPMENT,
INC

517 Farmers Union Bldg,
Denver
Pres: J F Lannan
Exec VP: Allen D Gray
Sec-Treas: W H Hoadley
Prod Mgr: G T Hator
Purch Agt: P M Cheney
Met Consultant: H L Hansen
(See S Dak)

MOLLIE KATHLEEN MNG
CO

Cripple Creek
MOLLIE KATHLEEN MINE, Au

MOLYBDENUM CORP OF
AMERICA

Empire
URAD MINE & MILL, undergr,
Mo, MoS
Mgr: John B Carman
Under devel
(See Calif, N Mex, N Y, Pa)

MONOGRAM MNG CO

P O Box 65, Norwood
PAY DAY MINES, Uranian,
undergr, U₃O₈, V₂O₅
Gen Mgr: A F Skalla
Contractors: C C P MNG &
Clifton Carter
Prod: 40 tons per day

MONOGRAM URANIUM &
OIL CO

206 Petroleum Bldg,
Grand Junction
Pres: Ray Baxter
VP: Howard P Carr
Sec-Treas: George E Ditts
GROUND HOG MINE, Naturita,
undergr, U₃O₈, V₂O₅
Mine Supt: Joseph N Trudgen
Prod: 18 tons
(See Utah)

MONOGRASS URANIUM

Naturita
U₃O₈ Prod

Colorado

MORE, A B

Balding Star St, Boulder
RED BIRD MINE, Boulder
County, Wyo.
(See Calif)

MOUNTAIN DALE MNG CO

1366 La Paloma Way,
Colorado Springs
BOOMER LODS, Park County,
pegmatites

MTN STATES OIL & URANIUM CO

786 Univ Bldg, Denver 2
U₃O₈ Prod

MOUNTAIN TOP MNG & MLO CO

189 Colorado Ave,
Grand Junction
LEASES, Montrose County,
U₃O₈

MULLINS, J A

2801 St, Lake City
MINE, U₃O₈

MUNROE, ERNEST W

Rt 2, Box 273, Fort Collins
ROCKY MOUNTAIN, Larimer
County, U₃O₈

NATIONAL BERYL MNG CO

Box 1349, Estes Park
MINE, Larimer County,
pegmatites

NATIONAL LEAD CO, INC

(Member Nuclear Metals Div,
Nat'l Lead Co)
P O Box 1849, Grand Junction
Grand Junction Office
Manager: R G Beverly
Tech Dir: C E McArthur
AEC Research Contractor
Radioactive pollution studies
(See Ark, Cal, La, Mont, Mo,
Nev, Tenn, NY, Tex, Wyo)

NATOMAS CO

Fairplay
DREDGE #1, Park County, Au,
Ag
Local Supt: Webb Skinner
Mile
(See Calif)

NEDERLAND MINES, INC

1821 Marine St, Boulder
Pres: Carl Rosen
VP & Sec: G A Horvath
CARIBOU MINE, Boulder, 3 mi
W of Nederland, undergr, Ag, Pb,
Au
Gen Mgr: Matthew Olson
Mile
100-TON FLOT MILL, 8 mi E of
Nederland

NEESHAM MNG CO

Nurita
Gen Mgr: Glenn D Neesham
BUCKSKIN MINE, Bull Canyon,
undergr, U₃O₈, V₂O₅
PEODIE, Boulder Basin, U₃O₈,
V₂O₅
Under devel
RUSTY MINE, undergr, U₃O₈,
V₂O₅

NEILSON, CLARENCE L

P O Box 436, Telluride
U₃O₈ Prod

NEPTUNE URANIUM CORP

2525 Walnut St, P O Box 927,
Denver 1
Pres: W E Griffith
VP & Gen Supt: L A Griffith
Sec: Ray Carson
Treas: Fred Duran
SHAMROCKS, KINGPINS &
OTHER MINES, undergr, U₃O₈,
V₂O₅
Geol: Paul H Keating
Prod: 2-3 tons
Under devel

NEW IDRIA MNG & CHEM CO

Idria, San Benito County,
California
Pres: C Hyde Lewis
Sec-Treas: Arthur W Goring
URANIUM DIVISION, P O Box
311, Grand Junction, undergr,
U₃O₈, V₂O₅
Gen Mgr: Dean Nicholson
JOHNNIE MAE MINE, Beaver
Mesa, undergr, U₃O₈, V₂O₅
PACK RAT, SHAKIN QUACKIE
& HUBBARD HOMESTEAD MINES

Beaver Mesa, undergr, U₃O₈, V₂O₅

(Leased to Beaver Mesa Uranium
Inc)
(See Calif)

NEW JERSEY ZINC CO

EMPIRE ZINC DIV
Hillman
Supt, Gilman Oper: W L Jude
Plant Chief: Harold Steinmetz
Personnel: Frank Sherwood
Accountant: Carroll G Barnes
EAGLE MINE, undergr, Pb, Zn
Mine Chief: A M Karvacki
1,200-TON FLOT MILL
Mill Frns: Foster J Withnauer
(See Ill, W J, N Mex, N Y, Pa,
Tenn, Va, Wis)

NEW MOLINE MNG CO INC

2 Brethowen Bldg, Montrose
MINE, U₃O₈

NORBUTE CORP

405 Park Ave, New York 22
Pres: Nicolas M Salgo
WESTERN MNG DIV,
P O Box 1709, Grand Junction,
Colorado
VP: D C Deringer
Mgr: Abbott Charles
Geol: Kirby C Coryell
(See N Y)

NORTH STANDARD MNG CO

Box 605, Provo, Utah
MINE, BULL CANYON, Hamrita,
undergr, U₃O₈
Mine Frns: Melvin R Conley
Prod: 15 tons
MILL, Grand Junction

NUCLEAR ENGINEERING CORP

c/o Quist Neuman & Quist,
415 Symon Bldg, Denver 2
LONG'S GULCH PLACER,
Chaffee County, pegmatites

OKAN URANIUM CORP

835 Hall Ave, Grand Junction
U₃O₈ Prod

OLIVERS BROS

Norwood
AMERICAN EAGLE MINE, San
Miguel County, U₃O₈, V₂O₅

OMNI-METALS INC

Box 500, Salida
Pres: W E Burleson
VP: John A Murphy
Sec: Harold R Kester
GARFIELD MINE, 30 mi W of
Salida, undergr, Pb, Au, Ag
Idle

ORTMAYER MNG CO

330 S 1st St, P O Box 1846
Grand Junction
Pres: C G Ortmayer
VP: Hilda Ortmayer
Sec: John Spilght
LEON LEASE, Egnar,
undergr, U₃O₈, V₂O₅
Gen Mgr: Frank Turman

OUTLET MNG CO

Box 38, Creede
Purch Agt: James M Muir
PHOENIX LODS, 3 mi N of
Creede, undergr, Pb, Ag, Au
Mine Supt: Gavin W Skinner

OZARK-MAHONING CO

MNG DIV
310 W 6th, Tulsa, Okla &
Rosiclare, Ill
NORTHGATE MINE, undergr,
open pit, fluorapatite, Cowdrey
Gen Supt: R K Wilco
Mine Supt: F H Hansen
Prod: 333 tons
350-TON FLOT MILL, at
Northgate mine
Mill Supt: Gus Paris
EMMETT & AFTERTHOUGHT
MINES, undergr, fluorapatite
Contr: H B Williamson
Prod: 120 tons
120-TON FLOT MILL, at
Jamestown
Mill Supt: P B Baker
(See Ill, N Mex, Okla)

PACIFIC INDUSTRIES, INC

(FLANDERS MNG CO -
wholly owned subd)
P O Box 661, Grand Junction
Pres: W L McIntyre
VP: E M Gage, Mark K Shipman
Sec-Treas: Ronald Bailey

Asst Sec: Thomas K Youngs,

H B Fraser, Paul T Wolf,
GATEWAY MINES, Gateway,
undergr, U₃O₈, V₂O₅
Mine Frns: W S McLaughlin
Prod: 30 tons per day
(See Calif)

PACIFIC URANIUM MINES CO

1934 White, Grand Junction
Pres: B Slibert
Sec-Treas: I Klubok
Ch Geol: N Redmond
(See N Mex)

PARK CITY CONS MINES CO

39 Broadway, Rm 3007,
New York 6
Pres & Treas: Carl Stehle
VP: J L Chadwick
Sec: George C Maw
KEYSTONE MINE, Crested Butte,
25 mi N of Gunnison, undergr, Zn,
Pb, Cu, Ag
Gen Mgr: Nolan Probst
Geol: F T Stehle
360-TON FLOT MILL, Crested
Butte
(Operated by Amer Smelt & Refin
Co, see Utah)

PARKER MNG & DEVEL CO

421 Glenwood Ave,
Grand Junction
Pres: Pierre Parker
BEAN PATCH MINE, Slick Rock,
undergr, U₃O₈
Gen Mgr: Earl B Murray

PASSIFLORA MNG CO

P O Box 749, Canon City
Pres: Charles A Biley
VP & Gen Supt: M N Taylor
Met: Merle N Shaw
Sec: J D Blunt
PASSIFLORA MINES, 1 1/2 mi N
of Westcliffe, undergr, Ag, Pb,
Cu, Au, U₃O₈
Idle

PATTERSON, JAMES L

Uravan
U₃O₈ Prod

PENCHO OIL & MNG INC

36 W Broadway, Salt Lake City,
Utah
MINE, U₃O₈

PERSOLITE PRODUCTS INC

Box 2056, Denver
MINE, Custer County, Perlite

PETERSON, FREDDIE N

P O Box 531, Uravan
MINE, U₃O₈

PETERSON, RICHARD L & ANDERSON, BRUCE

Box 8, Douglas, Wyo
GRACE-GREENWOOD MINE,
Cripple Cr, Ar, undergr
Geol: Warren Ove
Mine Frns: Louis Pfeffer
Prod: 12 tons per day
Under devel
(See Western Eng Corp, Wyo)

PHILLIPS, CLAYTON E

P O Box 1175, Rifle
U₃O₈ Prod

PINNACLE EXPLORATION, INC

100 Park Ave, New York 17
Pres: F D Wilson
VP: J T Hall
Sec-Treas: E A Salo
AKRON MINE, White 1 line
Idle
INDIAN CREEK PROSPECT,
Gunnison, undergr, U₃O₈
Gen Mgr: J E Dunn
Gen Supt: R J Flynn
Geol: B C Scott
Under devel
(See N Y)

PIONEER EXPL CO

Box 664, Craig
MINE, U₃O₈

PITTSBURG-NOTAWAY MINES

Box 67, Central City,
PITTSBURG-NOTAWAY MINE,
undergr
Gen Mgr: Ernest A Davis
Gen Supt: Robert E Brooks
Geol: Robert T Forest
Mine Supt: Robert E Brooks
Under devel

POLAND, C E

1703 Grand Ave,
Grand Junction
MINE, U₃O₈

POLAND & POLAND

P O Box 357, Grand Junction
U₃O₈ Prod

PORTER & CO

P O Box 554, Uravan
U₃O₈ Prod

PRIDE OF THE WEST, INC

Box 142, Silverton
Agnes C Leslie Larson
PRIDE OF THE WEST MINE, San
Juan County, Zn, Pb, Ag, Au

RAINBOW PLACER, INC

2844 Depew St, Denver
Pres: Dan C Harrington
VP: R V Seaton
Sec: Martha V Keene
PLACERS, Tin Cup, Gunnison
County, Au, Ag
Idle

RAMPART MNG CO

Box 1776, Colorado Springs
IRON MTN CLM, Fremont County,
Mn
COTTONWOOD NO 1, Fremont
County, Mn
RAMPART NO 1, El Paso County,
Mn

RAY, ROBERT R

4440 Jason St, Denver 11
STUBBURN SAND & GRAVEL PIT,
Jefferson County, Au, Ag

REED, BELISLE & REED

Naturita
MINE, U₃O₈

REED, GORDON

Naturita
U₃O₈ Prod

REED, LEE C

Naturita
MINE, U₃O₈

REX URANIUM CORP

Box 1236, Farmington, N Mex
DUCHESS MINE, Uravan,
undergr, U₃O₈, V₂O₅
Gen Mgr: R J Scanlon
Leasee: A E David
Under devel
ADAK MINE, Uravan,
undergr, U₃O₈, V₂O₅
Gen Mgr: R J Scanlon
Mine Supt: Stan Reed
Prod: 30 tons per day
Under devel
(See N Mex)

REYNOLDS MNG CORP

Poncha Springs
MINE, undergr & Surf, fluorapatite
MILL
Mile
(See Ark, N Y, Va)

RICO ARGENTINE MNG CO

217 Kearns Bldg, Salt Lake City,
Utah
Pres: Sherman B Hinckley
VP: J C Johnson
Sec: L J Lerwill
Treas: B B Hall
Purch Agt: Sherman B Hinckley
MT SPRINGS & ARGENTINE
MINES, Rico, undergr, open pit,
pyrite, Pb, Zn, Ag
Gen Mgr: Sherman B Hinckley
Assayer: H Tuller
150-TON FLOT MILL, at mine
Assayer: H Tuller
150-TON SULFURIC ACID PLANT,
at mine
(See Utah)

ROBINSON, BOYD

1634 Canon Ave,
Grand Junction
IRON LODS NO 3, San Miguel
County, Fe

ROBINSON, ELBERT C

(ROBINSON RANCH MINES)
Livermore
RED HILL NO 1 MINE, undergr,
open pit, U₃O₈, Fe

ROBUSH, JOHN & CO

Box 208, Cripple Creek
OLD GOLD, Teller, Au, Ag

ROSARIO EXPLORATION CO

212 Electric Bldg,
Grand Junction

Pres: R M Rainberger

VP: H S Anderson
Sec-Treas: G E McDaniel
Explor
(Subd of New York and Honduras
Rosario Mng Co - See N Y)

ROUVILLE MNG CO

Silverton
Pres: Ernest S Hoffman
ROUVILLE MINE, Red Mt mng
dist, Ouray County, undergr,
Pb, Cu, Ag
Gen Mgr: Ernest S Hoffman
Under devel

ROYAL FLUSH MINE

Columbine
Pres: Henry Granberg
ROYAL FLUSH MINE, undergr,
Au, Ag, U₃O₈ prospecting
Gen Mgr: Al Ramsey
Under devel

SABRE-PHON CORP

Boken Bldg, Santa Fe, N Mex
Pres: E D Boken, II
VP: W R Montgomery
Sec: George Glover, Jr
Treas: Hugh H Craigie
STEER #8 MINE, Bull Canyon
dist, Montrose County
(See N Mex)

SACRAMENTO GULCH MNG CO

978 Miller St, Lakewood 15
Pres: Arthur A Cervi
VP: Sisto Cervi
Sec: May Cervi
SACRAMENTO MINE, Park
County, under, Ag, Au, U₃O₈
Mine Supt: Cervi
Under devel

SAGE, LESTER

Parasite
MINE, U₃O₈

GEORGE H SAGER

525 Chayenne Blvd
Colorado Springs
MINE, Boomer Lode, Park Cty
beryl

ST ANTHONY URANIUM CORP

P O Box 1799, Grand Junction
Pres: Frank Goodbaugh
VP & Gen Mgr: A M Mastrovich
Sec: John P Fitz-Gibbon
Treas: Thomas E Congdon
URANIUM EXPLORATION,
N Mex
(See N Mex & Kennecott Copper
Corp, N Y)

ST JUDE MNG CORP

P O Box 1080, Pueblo
Pres: L G Daltie
VP: A M Broberg
Sec-Treas: Jack C Costanza
SWEET HOME MINE, Alma,
SAMMY BOY MINE, Bonanza,
Pb, Au, Cu, Ag, undergr
Gen Mgr: Jack C Costanza
Mine Supt: Marvin Chase

ST REGIS URANIUM CORP

2285 S Jackson St, Denver
Pres: E B Brannan
VP: Thomas Kasalis
Treas: Neil Horan
Sec: T K Brannan
LONE PINE MINE, Montrose
County, undergr, U₃O₈, V₂O₅
Gen Mgr: E B Brannan
Mine Supt: Delbert Dyer, Lessee
Prod: 15 tons

SAN JUAN LEASING CO

c/o Grover Williams, Uravan
U₃O₈ Prod

SAVERS, LUTHER C

1101 Institute, Colorado Springs
OLIN CAMPER LEASE, Custer
County, Mn

SHATTUCK DENN MNG CO

317 Main St, Grand Junction
Gen Mgr: Thomas W Newell
Gen Supt: Frank W Garrett
Geol: Carl W Appelin
Purch Agt: Jack D Hill
TOM BARDON MINE, undergr,
U₃O₈ Bld Indian Dist

SHATTUCK S W CHEM CO

c/o John B Saunders,
1805 S Dannonk St, Denver 23
MINE, pegmatite

SHELLHAAS & WERNET

Naturita
ILLINOIS DUMP MINE, Boulder
County, W₀

SILVER BELL MINES CO

433 Guaranty Bank Bldg,
Denver 2
Pres & Gen Mgr: E H Sanders
VP: E J Nord
Sec: J W Metzger
SILVER BELL & CARBONERO
MINE, Ophir, undergr.,
Au, Pb, Ag, Cu
Gen Supt: Lesley E Smith
Idle

SPIROCK INDUSTRIES, INC

2900 Nat'l Bank of Tulsa,
Tulsa, Okla
Pres: Lee A Huey
VP: Rowland D Young &
Neil W Stahlein
Sec: L G Jump
MINE, Box 461, Boulder,
undergr., W₀
Mine Supt: George Jump
Under devel
(See N Mex)

SILVER BULL MNG

771 S Santa Fe, Pueblo
RIO FOUR, Summit County, Au
Under devel

SKIDMORE MNG CO

Box 388, Delores
Pres: T H Skidmore
VP: G H Skidmore
LEGION GROUP, undergr., U₀g,
V₀g
Asst Gen Mgr: A L Skidmore
PARROT GROUP, undergr.,
U₀g, V₀g
Gen Supt: Chesa Allmond

SMART, O E

Naturita
U₀g Prod

SMITH, EDWARDS S

Naturita
MINE, U₀g

SMITH, RICHARD F

Dove Creek
MINE, U₀g

SNYDER, C F & SONS

Dove Creek
MINE, U₀g

SOUTHERN & CALAHAN

Naturita
MINE, U₀g

SPIER, HARRY W

1445 Hawthorn Ave, Boulder
BLACK DIAMOND MINE, Boulder
County, W₀

SPRAY, EDWIN C

187 Washington St, Denver 3
SWEET HOME MINE, Alma,
undergr., Ag, Cu, Pb
Under devel

SPRINGER, D P

Naturita
U₀g Prod

STAATS & HIGHTOWER

Naturita
U₀g Prod

STANDARD URANIUM

CORP
(Standard Col-U-Mex Joint
Venture)
264 South 4th East, Moab, Utah
P O Box 395

MCRAWER MINE, Crested Butte,

undergr., Pb, Zn, Ag
Mine Supt: Jack H Dressel
Ch Engr: Robert R Ward
Gen Supt: Robert Hurst
Under devel
MOUNTAIN MONARCH MINE,
Ouray
Under devel
130-TON FLOT MILL, at mine
(See Ariz, Utah)

STRATTON CRIPPLE

CREEK MNG & DEVEL CO
Box 178, Colorado Springs
Pres: A G Hill
Sec-Treas: Kenneth Brown
VP-Supt: James H Keener
MINES, under lease

SUN RAY MNG CO

Naturita
MINE, U₀g
(See Utah)

TALL TIMBER MNG CO

c/o L R Hinman, 909 Grant St,
Denver
MINE, near Indian Hills,
feldspar, Be, Mica, U₀g
Under devel

TENDERFOOT MNG CO

818-17th St, Denver 3
MINE, Teller, Au, Ag

TERMINAL EXPLOR CO

610 Road Ave, Grand Junction
Pres: E H Jones
VP: Merle McKensie
Sec: J M Mueller
ELIZABETH GROUP, Bine Mesa,
Gateway Mng Dist, Mesa County,
undergr., U₀g, V₀g
Prod: 10 tons per day
(all mines oper under contract)

TEXAS-ZINC MINERALS

(Subsidiary of New Jersey Zinc Co)
1128 Colorado Ave,
Grand Junction
Pres: A L Hayes
Gen Mgr: N K Banks
(See Utah)

THORNBURG MNG CO

140 W Main, Grand Junction
(See Utah)

TRACE ELEMENTS CORP

(UNIT OF UNION CARBIDE
NUCLEAR CO)
Maybell
MAYBELL MINE & MILL,
Maybell, surface, U₀g
Gen Mgr: J L Lake
Mgr Mines: J F Emerson
Mgr Plant: J E Brenton
Mine Supt: A W Woods
Mill Frnt: J E Massey
Mill Supt: F T Temple
Asst Mill Supt: H F Wilson

TRANS MTN URAN CO &

GLOBE HILL
717 Independence Bldg,
Colorado Springs
MINE, U₀g

TREASURE MOUNTAIN

GOLD MNG CO
202 Midland Savings Bldg,
Denver 2
Pres: Guy L V Emerson
Sec: A W Fischer
SANDIAGO, SAN JUAN, QUEEN,
GOLDEN FLEECE & SCOTIA
MINES, 11 mi NW of Silverton,
undergr., Au, Ag, Pb, Zn, Mn
Idle

TREASURY VAULT

URANIUM CORP
718 Symes Bldg, Denver
Pres: Ben L Wright, Jr
VP: LeRoy A West
Sec: David J McKee
Treas: Delbert R Peterson
Gen Mgr & Purch Agt:
Robert R Hale
CHAMPAIGN & CONEY MINES,
Fairplay, undergr., U₀g
Under devel

TUNGSTEN MNG CO, INC

420 Pine St, Boulder
Pres & Treas: George W Cowdery
VP & Sec: William D Cowdery
TUNGSTEN MINE, Boulder,
undergr., W₀

TUNGSTEN REFINING INC

250 Pearl St, Boulder
MILL, Boulder County, W₀

TYLER, L W

Gold Hill Star Rt, Boulder
GRANDVIEW MINE, Boulder
County, W₀

UNION CARBIDE NUCLEAR

CORP (DIV OF UNION
CARBIDE CORP)
1600 Use Avenue,
Grand Junction, Colorado
Gen Mgr: Colo Plateau -
J L Lake
Mgr of Plants: J F Brenton
Asst Mgr of Plants:
H K Jackson
Mgr of Engrg: W L Barnes
Mgr of Acct & Finance:
C P Martin
Ch Geol: J E Mettles
Mgr Process Dev: D C Seidel

MINE & MILL, Uravan,

undergr., U₀g, V₀g
Plant Supt: A A Sada
Mine Supt: J R Borden
Mill Supt: A W Lankensau
MINE & MILL, Maybell (Trace
Elements Corp Unit) open pit
U₀g, V₀g
Plant Supt: F T Temple
Mine Supt: A J Sanders
Mine Supt: W W Whit
CHEMICAL MILL, Rifle
Plant Supt: D L Stockton
Asst Plant Supt: J M Chandler
(See Calif, N Y, Utah, Wyo)

UNITED GOLD MINES CO

Box 127, Cripple Creek
Pres: M E Shoup
VP & Gen Mgr: Max W Bowen
Gen Supt: C H Carlson
VINDICATOR & PORTLAND
MINES, Victor, undergr., Au, Ag
Idle

U S GYPSUM CO

309 W Adams St,
Chicago 6, Ill
QUARRY, Loveland, gypsum,
open pit
Works Mgr: J H Miner
(See Calif, Conn, Ill, Ind, Iowa,
Mass, Ohio, S D, Tex, Utah, Va)

U S LITHIUM CORP

1205 Walker Bank Bldg,
Salt Lake City, Utah
BROWN DERRY & TUCKER
MINES, Gunnison County, undergr:
lepidolite, apodumene
Gen Mgr: Paul T Walton
(See Utah)

U S SOIL CONDITIONING

Co
Rainbow Bldg, Box 348, Salida
Pres: J H Lionelle
TUMBLE MOUNTAIN, surface

UNITED URANIUM CORP

406 Empire Bldg,
430 16th St, Denver 2
Pres: Ray Fahlender
VP: Edgar Payton
Sec-Treas: R H Foster
HOT DRILL HILL PICO H MINES,
undergr., Dove Creek, U₀g,
V₀g
Under devel (lease agreement)

URADOX MNG CO

Montrose
MINE, U₀g

URANIUM EXPLORERS

SYNDICATE
645 Emerson St, Denver
Gen Mgr: J Bromfield
URANINITE, CORVUITE claims
in Mesa and San Miguel counties
Under devel

URANIUM METALS, INC

Egnar
FALCON URANIUM MINE,
Bishop Canyon, Montrose County,
Ch Engr: Dr A A Zangara
U₀g Prod

URANIUM PRODUCERS,

INC
1536 Welton St, Denver 2
Mgr: Harry E Coppin
URANIUM MINE, Slick Rock
dist, Montrose County

U-TAH-SEE MNG

SYNDICATE
P O Box 673, Ophir
Mgr part: J E Montgomery
Part: R E Slaughter
Hugh Thomas
W Stevenson
SAN BERNARDO & FAVORITE
GROUPS, Ophir, undergr., Au,
Ag, Pb, Cu, Zn
Gen Mgr: J E Montgomery
Under devel
300-TON FLOT MILL, Ophir
sulphide

UTARADO MNG CO

P O Box 287, Montrose
U₀g Prod

UTCO URANIUM CORP

310 1st Nat'l Bank Bldg,
Denver
Pres: Geo S Casey
VP: Fred C Clymer

UTIDA CO

P O Box 59, Moab, Utah
U₀g Prod

VANADIUM CORP OF

AMERICA

Durango

VP-Gen Mgr: D W Viles

DURANGO PERSONNEL

Asst VP: Fred Drinker

MINES, Colorado Plateau,

undergr., open pit, V₀g, U₀g

Dir of Plateau Oper: Page Edwards

Mine Supt: Robt L Anderson

Mine Supt: Wm W Witmeyer

Ch Geol: E E Waulter

Geol: Jack L Benham

MILL, Durango

Mill Supt: John A Maxwell,

L A Daniels

Gen Master Mech: C T Newland

Master Mech: C Dale Prior

Lab Supt: Roland G Veasor

Shop Frnt: Kenneth Erickson

(See Ariz, N Mex, N Y)

VANADIUM QUEEN

URANIUM CORP

P O Box 874, Grand Junction

Pres: Don Danvers

Sec-Treas: Dick Harrison

VANADIUM QUEEN MINE,

La Sal Creek, undergr., U₀g,

V₀g

Res Engr: John I Schumacher

Prod: 25 tons

(Oper under contract to Joe Pitts,

133 W Mesa, Grand Junction)

VILLA GROVE TURQUOISE

MINE

Villa Grove

LODE, Saguache County,

Turquoise

VOGEL URANIUM MINE &

EXPLOR CO

Box 3183, Amarillo, Texas

Purch Agt: Harold W Vogel

BLUE BONETT NO 5 MINE, Lake

City, undergr., Au, Ag, Zn,

Bozite, U₀g

Gen Mgr & Mine Supt:

Harold W Vogel

Asst Gen Mgr: Harold H Ham

Under devel

(See N Mex)

W A H CHANG CORP

Box 441, Boulder

50-TON GRAY HILL, Sugar Loaf

Road, Boulder

Rep in charge: Earl G Sweeney

10-TON FLOT GRAY HILL,

Sugar Loaf Rd, Boulder

(See Calif, N Y, Tex)

W & W MNG CO

Silverton

LITTLE RUBY MINE, Red Mt

mng dist, San Juan Mts, undergr.,

Au, Ag, Pb

Under devel

WATERS, MARION R

Rte 1, Dolores

U₀g Prod

WESTERN FELDSPAR MNG

CO

Box 671, Salida

Sec-Treas: J W Magnuson

PLANT, near Salida, feldspar

Under devel

WESTERN GOLD &

URANIUM, INC

Box 159, St George, Utah

RITO SECO MINE, San Luis, Au

Idle

(See Ariz, Utah)

WHITE CANYON MNG CO

1120 Colorado Ave,

Grand Junction

Pres: F J Maloti

VP: Travis H Redman

Sec: Walter E Will

Treas: E E Schwagler

Purch Agt: Troy E Wade

Gen Mgr: A F Boyd

(See Utah)

WILLIAMS MNG CO

Gallup, N Mex

MINE, U₀g

WILLIAMS MINING CO

Hurwood

U₀g

WILLIAMSON MNG CO

(Formerly H M Williamson & Son)

529 E 1st Ave, Denver

Managing Part: Harry D

Williamson, Box 431, Boulder

Part: H M Williamson

Sec: Omega Yates

BOULDER FELDSPAR CO

MINES, Jamestown, undergr,

open pit, CaF₂

Mine Supt: B D Lott

Prod: 150 tons

OSARK MAHONING CO FLOT

MILL, Jamestown

WOLNEY, BOB

Naturita

MINE, U₀g

WOODARD, CHARLES V

& CO

2809 U S Hwy 80,

Grand Junction

ZEE LEASE MINE, Gateway,

U₀g, V₀g, undergr

Gen Mgr: Charles V Woodard

Gen Supt: Frank E Woodard

Prod: 30 tons

WORCESTER MINES

1501 White Ave, Grand

Junction MINE, near Uravan,

FLORIDA

AMER AGRI-CHEM CO,
THE

196 Church St.,
New York 7, N.Y.
PHOSPHATE ROCK MINE,
Polk County, open pit, phosphate
(See N.Y.)

AMERICAN CYANAMID CO

30 Rockefeller Plaza,
New York 20, N.Y.
Pres: W. G. Malcolm
Sec: R. S. Kyle
Treas: G. C. Walker
Purch Agt: H. K. LaRoue
Mgr of Phosphate Oper:
Arthur Crago
GRANGE PARK & SYDNEY MINES,
Brewster, open pit, phosphate
Gen Mgr: E. M. Haynesworth
Asst Gen Mgr: R. N. Saunders
Gen Supt, Sydney: C. B. Duke
Gen Supt, Grange Park: F. A. Vogler
Geol: T. J. Patterson
Mech Eng: H. L. Taber
Met: R. J. McCrary
Elec Eng: C. A. Does
Prod: 34,000 cu yds matrix
(both mines)
6500-TON FLOT MILL, Brewster,
(both mines)
(See Ark, Ga, Va, N.Y.)

ARMOUR FERTILIZER
WORKS INC

Atlanta, Ga
MINE, Bartow, phosphate, open
pit
FLOT MILL, Bartow
(See Tenn)

CONTINENTAL MINERAL
PROCESSING CORP

1st Nat'l Bank Bldg,
Cincinnati 3, Ohio
Pres & Gen Mgr: Frederick A. Hawk
MINE, Brevard County, open pit,
rutile, ilmenite, stiroon
Prod: 70 tons
(See Ohio)

CORONET PHOSPHATE
CO, A DIV OF SMITH

DOUGLAS CO, INC
Box 186, Plant City
Pres: R. S. Rydell
Sec: W. H. Mowen
Purch Agt: G. W. Johnson
TENOROC MINE, Polk County,
near Auburndale, open pit,
phosphate rock
Gen Mgr: R. M. Wilbur
Gen Supt: W. H. Taylor
Dir Research: C. A. Hollingsworth
Mine Supt: L. G. Wood
Mine Eng: E. A. Sawitka
FLOT MILL at mine, washing &
screening
Mill Supt: C. E. Mills

DAVISON CHEMICAL CO
A DIV OF W. R. GRACE
& CO

Florida Phosphate Div
Box 471, Bartow
Gen Mgr: W. R. Fort
Prod Supt: J. D. Clary
Mgr, Prod Plant: J. L. Hunter, Jr.
Purch Agt: W. W. Thornton
Ch Chem: C. D. McDowell
Ch Eng: A. J. Frost
Elec Eng: W. W. Merkel
Geol: E. R. Scharer
Plant Eng: B. W. Johnson
Project Eng: C. M. Greene
Field Eng: T. L. Nelson
Mines Plant: M. P. McArthur
Safe Eng: J. R. Terry
Gen Mines Supt: B. P. Jones
Phosphate Rock Maint Supt:
E. J. Purcell
Triple Maint Supt: D. W. Flagg
Proj Eng: C. G. Olson
Process Eng: C. P. Peters
BONNY LAKE MINE, Bartow,
surface, phosphate
Supt: W. A. Allen

E I DU PONT DE NEMOURS
& CO

Pigments Dept, 1007 Market St.,
Wilmington, Del
HIGHLAND PLANT, (office)
Drawer A, Lawley,
TRAIL RIDGE PLANT, (office)
Drawer 755, Starke
HIGHLAND PLANT, 1 mi

E of Lawley, open pit, Ilmenite,
Zircon, Staurolite
Gen Mgr: Charles R. Hager
Prod Supt: A. D. Vincent
Maint Eng: Frank Lige
Plant Tech: J. L. Herberington
Mine Supt: W. C. Coran
Prod: 20,000 tons
TRAIL RIDGE PLANT, 6 mi E
of Starke, (Camp Blanding) open
pit, Ilmenite, Zircon, Staurolite
Gen Mgr: Charles R. Hager
Prod Supt: E. M. Coover
Maint Eng: F. W. Harris, Jr.
Plant Tech: J. F. Mulling
Mine Supt: V. A. Nichols
Prod: 20,000 tons
20,000-TON GRAY MILL,
Electrostatic
Mill Supt: Highland
E. V. Widgren
Mill Supt, Trail Ridge:
H. A. Nelson, J. L. Chitty
(See Del)

THE FLORIDA MINERALS
CO, DIV OF HOBART BROS CO

Box 1547, Vero Beach
Pres & Gen Mgr: N. W. Van Ausdal
Purch Agt & Gen Supt:
Sterling Dangler
MINE, Winter Beach, open pit,
rutile, stiroon, ilmenite
MILL, at mine

FLORIDIN CO

Tallahassee
MINES, Quincy & Jamieson,
surface, fuller's earth
MILLS

HOWARD PHOSPHATE CO

Box 3028, Orlando
Gen Mgr: R. M. Howard
MINE, Inverness,
surface, 300-ton bucket dredge,
soft, colloidal & hard
phosphate
Mine & Mill Supt: W. E. Marlow

HUMPHREYS GOLD CORP

P.O. Box 5493, Jacksonville 7
VP: J. P. Wood
VP-Gen Mgr: E. C. Weichel
JACKSONVILLE PLANT, 6 mi E
of Jacksonville, placer, ilmenite,
rutile, stiroon, monazite
Plant Supt: Homer Lewis
Prod Supt: A. D. Whisler
Plant Eng: J. U. Elledge
Purch Agt: S. L. Jackson
Mine Eng: R. M. Lewis
Mill Supt: L. A. Gray
Mine Supt: V. D. Mathews
Maint Supt: C. J. Bastedo
(See Cal)

INTERNAT'L MIN & CHEM
CORP, PHOSPHATE MIN
DIV

Old Orchard Rd, Shokie, Ill
Pres: T. H. Ware
VP: George W. Meyers
Sec: C. M. Edwards
Treas: R. A. Lenon
Purch Agt: C. F. Teeple
ACHAN & NORALYN MINES,
P.O. Box 867, Bartow, open pit,
phosphate
Prod Mgr: F. B. Bowen
Asst Prod Mgr: H. T. Loehr, Jr.
Asst Mgr: Eng: W. O. McClintock
(See Ark, Colo, Ill, Maine, Miss,
N. Mex, N.C, S.D, Tenn,
Va, Wyo)

KELLOGG CO

920 Franklin St, Ocala
PHOSPHATE MINE

KIBLER-CAMP
PHOSPHATE ENTERPRISE

Box 608, Ocala
Treas: Taylor Scott
Purch Agt: T. D. Felton
SEC II MINE, Dannelton, open
pit, hard rock, phosphate
Gen Mgr: D. B. Kibler, Jr.
Asst Gen Mgr: Clarence Camp II
Gen Supt: T. D. Felton
Mine Supt: N. T. Farrell
Prod: 100 tons

LONCALA PHOSPHATE CO

Box 338, High Springs
PHOSPHATE MINE, Fort White
Mina

MAGNET COVE BARIUM
CORP

Box 6504, Houston, Texas
MINE, Hinson, open pit, Fuller's
Earth

MILL, 200 tons dry grind
Dty Mgr: C. L. Wilkinson, Jr.
Plant Mgr: W. C. White
Prod Mgr: C. F. Talbot
(See Ark, Mo, Nev, Texas, Wyo)

RUTILE MNG CO OF
FLORIDA

11 Broadway, N.Y. 6, N.Y.
JACKSONVILLE MINE, South
Jacksonville, open pit, rutile,
Ilmenite, Zr
Prod: 50,000 tons per yr
(See N.Y.)

SUPERIOR PHOSPHATE CO

Box 476, Dunnellon
PHOSPHATE MINE
SWIFT & CO.
P.O. Box 208, Bartow
WATSON & VARI MINES, Fort
Meade, open pit, phosphate
Gen Mgr: H. P. Gould
Gen Supt: O. D. Bowers
Mech Eng: W. B. Hunt
Elec Eng: H. K. Young
Mine Supt: J. B. Grant
Asst Mine Supt: E. E. McKinney,
C. W. Justice
(See Ill)

UNITED CLAY MINES
CORP

Hawthorne
MINE NO 4, open pit
Mine Supt: L. F. Worley
MILL, at mine
(See Ga, Md)

VICTOR CHEMICAL
WORKS

Tarpon Springs, Fla
155 W. Wacker Dr,
Chicago 6, Ill
Pres: R. H. Weigel
Purch Agt: M. E. Jones
ELEMENTAL PHOSPHATE
PLANT
Plant Supt: E. A. Holtgrewe
(See Ill, Mont)

VIRGINIA-CAROLINA
CHEM CORP

Nichols
FLORIDA MNG DEPT,
phosphate
Mgr: H. L. Pascoe
MINES, Clear Springs, Homine
10,000-TON FLOT MILL
(See Tenn, Va)

GEORGIA

ALBEE-YORK MNG CO,
INC

Box 356, Cedartown
Pres & Gen Mgr: S. B. Albee, Sr.
VP: Glenn T. York, Sr.
Sec: Glenn T. York, Jr.
Asst Gen Mgr & Treas:
S. B. Albee, Jr.
Purch Agt: S. B. Albee, Jr.
OREMONT MINE, open pit, Fe
Gen Supt: Joe Allen Baker, Jr.
Mine Eng: S. B. Albee, Jr.
Prod: 200 tons
CANTON MINE, Canton
500-TON HEAVY MED MILL,
Dreant

AMERICAN CYANAMID CO

P.O. Box 58, Adairville
Mgr: A. W. Montgomery
NEW HOLLAND & OTTS MINE,
Hermitage, open pit, bauxite
CANDLER & THIGPEN PINE,
Andersonville, open pit, bauxite
Gen Mgr: A. W. Montgomery
Geol: Dr. H. E. Coffey, Jr.
Supt of Mng: H. V. Shell
MILL, Adairville
(See Ark, Fla, N.Y, Va)

AMERICAN TALC CO

Chatsworth
Pres: M. W. Glenn
VP: F. T. Glenn
Sec: J. R. Ferry
SHOP TUNNEL, 3 mi E of
Chatsworth, talc, soapstone
Prod: 100 tons
Mine Supt: Garvin Swanson
230-TON MILL, Chatsworth
Mill Supt: James Johnston
Mill Frm: Walt Weaver
(See Ala)

APPALACHIAN MINERALS
CO

Box 350, Monticello
VP & Gen Mgr: B. C. Burgess
Monticello, feldspar
Ch Eng: L. L. McMurray
(Subsidi of Pacific Tin Consol Corp)

ARRINGTON MNG CO

Box 115, Cedartown
Own: C. B. Arrington
MINE, Cedartown, Fe

BARTOW MINES, INC

Cartersville
Mgr: Geo Shropshire
IRON MINE, Aubrey

BARYTES MNG CO

Box 234, Cartersville
Pres: A. W. Wood
MINE, Cartersville, barite

CAIN, D. R.

Box 304, Cartersville
MINE, Barite

CLARK & CONNER

Canton
MINE, Fe

CONUTTA TALC CO, THE

Box 928, Dalton
Pres: L. F. Starr
VP: L. B. Farrar
See & Treas: S. A. Farrar
FORT MINE, 7 mi E of
Chatsworth, undergr, talc
& soapstone
Gen Supt: Robert Ensley
MILL, Chatsworth

EMPIRE MICA CO

Spruce Pine, N.C.
Own: S. L. & J. Phillips & Lin
Carpenter
HARP MINE, near Barnesville

THE FELDSPAR CORP

(APPALACHIAN MONTICELLO
MINERALS CO)
FELDSPAR CORP MINE,
Monticello, open pit, gr feldspar
Gen Mgr: Carroll Rogers, Jr.
Mgr: Thurman L. Willis
Supt: Fred Harrison
Eng: L. L. McMurray
Chem: Donald Fuik
FELDSPAR 1000-TON FLOT
MILL, Monticello
Mill Supt: Fred Harrison
(Subsidi of Pacific Tin Consol Corp
N.Y.)
(See N.C, Tenn)

GAMMAGE MINING CO

Cedartown
Pres: E. L. Gammage
IRON MINE
GEORGIA MARBLE CO,
CALCIUM PROD DIV
Tate
Pres: John W. Dent
VP: T. M. Shaw
NEW YORK MINE, Tate, undergr,
Limestone
Gen Mgr: Wm B. Tate, Jr.
Prod Mgr:
Gen Supt: Nelson Severinghaus, Jr.
Mine Supt: Wm L. Smith
Mine Supt: H. H. Buchanan
Mine Frm: E. Waldrop
Prod: 1200 tons per day
1200-TON-SCREEN,
WET & DRY MILLS (S)
Mill Supt: J. B. Jones

GEORGIA TALC CO

Chatsworth
Pres: M. Woodward Glenn
MINE, Talc
GLENN-REY CORP
Francis T. Glenn, Chatsworth
MINE, Hudspeth County, Tex,
Talc, Soapstone
(See Tex)

GRAVES & ACREE MNG CO

Cedartown
MINE, 3 mi W of Cedartown, Fe
Mills
GRAY MILL

HALE-GEORGIA MINERALS
CORP

Box 107, Cartersville
VP & Gen Mgr: Henry Styhal
MINE, Cartersville, Fe
Under devel
MINE, Cartersville, Mn
Idle

HODGE MINING CO

116 W Cherokee Ave,
Cartersville
Own: J. W. Hodge
Sec: M. T. Shaw
HODGE MINE, 14 mi W of
Cartersville, Fe
Supt: Clyde Shaw
Prod: 575 tons
MINE, Bartow County, surface,
Fe

LAKE MNG CO, INC

Box 343, Cartersville
MINE, Cartersville, Fe

LIBERTY GOLD MINE

4922 Blair Circle, Atlanta 19,
NE
Own & Op: Leonard Markun
LIBERTY MINE, Sugar Hill,
undergr, Au, Ag
Under devel

35-TON FLOT GRAY MILL, at
mineMINERALS PROCESSING
CO

c/o Flaxano Bros,
Chester Pike
& Angelo Ave, Crumlyne, Pa
MINE, Hogg property 8 mi S of
LaGrange beryl, mica
Mine Supt: Ed Stroils,
Shenandoah, Pa

MOSTELLER BROS

Cartersville
MINE, Cartersville, Fe

NEW RIVERSIDE OCHRE
CO

Box 370, Cartersville
Pres: J. R. Dellinger
Gen Mgr: W. B. Hawkins, Jr.
MINE, River Road, open pit,
barite, ochre
Gen Supt: John Cobb
Prod: 100 tons

PACIFIC TIN CONSOL
CORP

(See The Feldspar Corp &
Appalachian Minerals Co)

PAGA MNG CO

Cartersville
Supt: A. O. Frans
MINE, Cartersville, barite

POWHATAN MNG CO

8721 Windsor Mill Rd,
Baltimore 7, Md
Pres: Fred A. Mett
GAY & CORNELIA MINES,
Dillard, asbestos
Supt: H. M. Pitts
(See Md)

PRICE MINERALS, INC

3300 SW 27th Ave,
Miami, Fla
Pres: W. T. Price, Jr.
MINE, LaGrange, beryl,
mica
Coordinator: T. E. Braswell

SOUTHERN TALC CO

Box 278, Chatsworth
Pres: M. Woodward Glenn
MINE, Chatsworth, talc

THOMPSON-WEINMAN
& CO

Cartersville
BARTOW MINE, Cartersville,
gr barite
Gen Mgr: W. N. Bradley

UNITED CLAY MINES
CORP

Sandersville
MINE NO 8, open pit
Mine Supt: W. J. Smith
Asst Supt: Roger M. Carlson
MILL, at mine
(See Fla, Md)

WILLINGHAM LITTLE
STONE CO

316 Healey Bldg, Atlanta
MINE, Whitestone (large
undergr opening) Dolomite

WOODARD MINES

Cedartown
SHILOH & GEORGIA MINE,
Cedartown, Fe

YOUNG, GLEN

Rt 3, Canton
MINE, 3 1/2 mi NE of Ball
Ground, beryl

IDAHO

ABERDEEN IDAHO MNG CO

310 Bank St, Wallace
ABERDEEN-IDAHO GROUP,
Shoshone County, Au, Ag, Cu,
Pb, Zn
Under devel by The Bunker
Hill Co

ABOUT MINING CO

Box 1040, Wallace
Pres: Henry L Day
MINE, undergr, Pb, Ag
Idle

ADELMANN BROS MINES GROUP

623 Idaho St, Boise
Sec-Purch Agt: C R Adelmann
IDAHO BORREL HORSE, BLUE
GROUSE & EXTS, undergr, Au,
Ag
Geol-Elec Engt: Wm A Adelmann
Mech Engt: J P Adelmann
Met: A G Adelmann
24-TON GRAY MILL, Black
Hornet mng dist
Mill Supt: J P Adelmann

ALICE SILVER-LEAD MNG CO

Box 469, Wallace
Pres: O L Jones
Sec-Treas: H F Magnuson
Idle

AMAZON MNG CO

Box 372, Coeur d'Alene
Pres: A E Lundén
Sec-Treas: Geo M Servick
MINE, in Mont, Au, Cu, Ag
Idle
(See Mont)

AMERICAN SILVER MNG CO

133 W 4th Ave, Spokane, Wash
MINE, 1 mi S of Osburn, undergr,
Cu, Au
Under devel by Polaris Mng Co
(See Wash)

AMERICAN SMELTING & REFINING CO, N W MNG DEPT

Box 440, Wallace
Mgr: J C Kieffer
Asst Mgr: S E Zelenkov
Supt of Mines: W J Coombe
Supt of Mills: G A Dushler
Elec Supt: A W Beck
Mech Supt: S W Ward
Purch Agt: J P Folia
PAGE MINE, Pb, Zn, Ag
Supt: T M Tower
Asst Supt: C J Ward
Frm: Al Young, Richard James
MORNING MINE, undergr, Pb, Zn,
Ag
MINE Supt: H H Shook
Under devel
FRISCO MINE, Pb, Zn, Ag
Closed 12-31-56
JACK WAITE MINE, Duthie,
undergr, Pb, Zn, Ag
Supt: C H Blackwell
Frm: H F Legault
EAST HELENA PLANT
Mgr: S M Lane
Supt: K D Loughbridge
240-TON MILL, concentrator
(Operated under agreement with
Jack Waite Mining Co)
GALENA UNIT, 3 mi W of Wallace,
undergr, Ag, Pb
Supt: Norman Vianes
MINE Supt: G B Christian
MINE Fm: E Lomas
350-TON MILL, concentrator
Mill Fm: M Hopkins
(See Callahan Mng Corp)
(See Ariz, Calif, Colo, Ill, Md,
Mont, Nev, N J, N Mex, N Y,
Tex, Utah, Wash & Federal Mng &
Smelting Co, Mo)

ANACONDA CO, THE

23 Broadway, New York 4, N Y
Conda, Idaho
Pres: Clyde E Weed
Exec VP: E S McGlone
Sec & Treas: C Earle Moran
VP, Chg West Oper: C H Steele
Gen Mgr, West Mng Oper:
A C Bigley, Butte, Mont
Gen Supt of Mines: A R Simms,
Butte, Mont
Ch Mech Eng: R J Kennard, Butte,
Mont
PHOSPHATE MINE, Conda, open

pit, phosphate rock
MINE Supt: L E Tragger
MINE Fm: W J Desell
1000-TON CRUSHING, WASHING
& DRYING PLANT, Conda
Mill Fm: Charles Giles
Assayer: A T Peterson
(See Calif, Mont, Nev, N Mex, N Y)

BBS & M MNG CO

2435 W LaCrosse, Spokane 13,
Wash
PLOWBOY MINE, Northern
Idaho, Bonner County, undergr,
Pb, Ag
MINE Eng: Clive E Tedrow
Under devel
(See Wash)

BANNER-IDAHO MINES, INC

Scott Bldg, Wallace
Pres: John Davis
VP: C W Bentley
Sec-Treas: J W Coomerlth
Asst Sec: H F Magnuson
Idle

BEAR TRACK MINE

Warren, or 14533 San Jose Ave,
Compton, Calif
Own: Alvin Mayes, Aileen Mayes
BEAR TRACK GROUP, Warren,
undergr, Au, Platinum, Ag
Under devel
LUCKY STRIKE #1 & 2, BLUE
BELL #1, 2, & 3 MINES,
Undergr
Under devel

BLACK BEAR SILVER-LEAD MINES, INC

Box 847, Wallace
Pres: Geo F Ringel
Sec-Treas: R N Kingsbury
BLACK BEAR GROUP, near Gem,
Shoshone County, Ag, Pb, Zn, Cu
(Leased from Black Bear Mines Co
& being developed by Metropolitan
Mines Corp)

BRADLEY MINING CO

Bradley Field, Boise
Exec VP: John D Bradley
YELLOW PINE MINE,
Stibnite, undergr & open pit, WO,
Sb, Au, Ag
Mgr: Edwin Adams
Idle

BUNKER HILL CO, THE

The Bunker Hill Bldg,
640 Market St, San Francisco 4,
California
Pres: John D Bradley
VP: Emmett G Solomon,
W G Woolf, D L Feathers,
H N Cutting, H E Lee
Sec: D L Feathers
Treas: Emmett G Solomon
Purch Agt: Gil Mayes
MINE Mgr: Jos Gordon
Ch Geol: R H McConnell
Mgr, Plant Btr: L M Griffith
BUNKER HILL & CRESCENT
MINES, Box 28, Kellogg,
undergr, Pb, Ag, Zn
MINE Mgr: Jos Gordon
Supt: E B Olds
Ch Mine Assayer: Irving Laskey
MINE Fm: Paul Sloan,
Don Wilson, George Mast,
William Coker
Prod: 1,500 tons
2500-TON FLOT
CONCENTRATOR, Kellogg
Mill Supt: Norman J Sather
Asst Mill Supt: J Gordon Craig
Mill Fm: Paul Tietze
LEAD SMELTER, Kellogg
Supt: George Dunn
Asst Supt: Charles Hansen
Ch Research Met:
Donald Ingvaldsd
Ch Chem: L W Burgess
Prod: 100,000 tons
ELECTROLYTIC ZINC PLANT,
Kellogg
Supt: Walt Schmittroth
Ch Research Met:
Gregory Popoff
Ch Research Chem:
Leo Baumeister
Prod: 73,000 tons
STAR MINE, Burke (Operated
by contract by Hecla Mng Co)
RED BIRD MINE, Clayton,
undergr, Pb, Ag
(See Calif, Wash)

CALERA MINING CO
BLACKBIRD DIV
(Subdiv of Howe Sound Co)

Cobalt
BLACKBIRD MINE, Cobalt,
undergr, open pit, cobalt, Cu,
Ni, Ag
Prod: 1,000 tons
Mgr: E B Douglas
Geol: W C Cole
Mech Eng: J P Smith
MINE Supt: K Kus
MINE Fm: W O'Neal
MINE Eng: Thomas Wilson
1,000-TON FLOT MILL
Mill Supt: N R Stewart
Mill Fm: Rusty Bick
Assayer: Morris Olson
(See Howe Sound Co, N Y;
Manganese Inc, Nev)

CALLAHAN MNG CORP

100 Park Ave, New York 17, NY
GALENA MINE, Wallace, undergr,
Au, Cu
Prod: 350 tons per day
(Leased to Amer Smelt & Refin Co)
(See N Y)

CAMAS URANIUM MNG & DEVEL CO

Gooding
Op: Donald F Vaught &
Lowell Fields
20 CLAIMS, Little Smoky district,
Camas County, undergr, Au, Ag,
Pb, U₃O₈
Under devel

CAPITAL-SEABOARD CORP

900 Oil & Gas Bldg,
Wichita Falls, Tex
LONG DIKE MINE, Cobalt, open
pit, cobalt
Gen Mgr & Mine Supt:
Barrett Waferman
Mech Eng: C P Mechanicky
Under devel
(See Ariz, Mont, N Mex, Tex,
Utah)

CHAMPION MINE

Box 281, Mackay
Pres: J L Ausich
MINE, 8 mi S of Mackay, undergr,
Pb, Cu, Ag
Prod: 15 tons crude

CLAYTON SILVER MINES

Box 890, Wallace
Pres: W M Yeaman
VP: John Preisner
Sec-Treas: Ray Morrison
CLAYTON SILVER MINES,
Clayton, undergr, Pb,
Ag, Zn
Gen Mgr: Norman M Smith
Gen Supt: R J Legard
MINE Supt: Dick Settles
Prod: 105 tons
100-TON FLOT MILL

COEUR D'ALENE MINES CORP

203 Hyde Taylor Bldg, Wallace
Pres: H C Mowery
VP: P E Jacobs
Sec: W A Callaway
MINERAL POINT MINE, Osburn,
1 mi S of Osburn, Ag, Cu
Under devel
(Operated by Polaris Mng Co)
600-TON FLOT MILL

COEUR D'ALENE SILVER GIANT, INC

Box 838, Kellogg
Pres & Gen Mgr: Harry G Alway
Sec-Treas: C Whalen
MINE, E Fork of Big Creek,
Kellogg, Ag, Pb
Idle
82 LODE CLAIMS, Shoshone
County, under working contract

COFFEE POT MINES

Gannett, Idaho
COFFEE POT MINE, Galea
dist, Blaine County, open pit,
Au, Ag, Cu, Pb, Zn
Pres-Gen Mgr: Clay Eskridge
Sec-Coch: Dawn Eskridge
Treas-Met: Roy Eskridge
Under devel

CONJECTURE MINES, INC

326 Wiggett Bldg,
Coeur d'Alene
Pres & Purch Agt: Donald E Major
421-427 W Third Ave, Spokane,
Wash
VP: H E Sanderson
Sec & Treas: Lyle H Fonnell
CONJECTURE MINE, Lakeview
Lndg via Bayview, 5 mi SE of

Lakeview Landing, undergr, Ag,
Pb, Zn, Cu, Au, Sb
Gen Mgr: Donald E Major
Asst Gen Mgr & Mine Supt:
Walter N Campbell
Mech Eng: Ernie Williams
Met: Frank Etcheberger, Jr
Asst Mine Supt: Ronald Utz
Prod: 50 tons
Under devel
80-TON FLOT MILL, at mine, Ag
Mill Supt: Frank Etcheberger, Jr
(Under devel by Federal
Uranium Corp)

CORDERO MNG CO

131 University Ave, Palo Alto,
California
VP: S H Williams
Gen Mgr: J Eldon Gilbert
WILD HORSE MINE, Mackay, 38
mi W of Mackay, undergr, Cu,
WO,
Asst Gen Mgr: V P Haas
Gen Supt: Edward Hager
Idle
50-TON GRAY MILL, at mine
(See Calif, Nev)

DAISY KINGS CLAIMS

Garden Valley
Own: E W Bowman
CLAIMS, Deadwood Basin, Ag, Au,
Pb, Cu
Idle

DAY MINES, INC

Box 1080, Wallace
Pres & Gen Mgr: Henry L Day
Asst Gen Mgr: Rollin Farmer
Sec: S F Heitfield
Purch Agt: G T Kelton
DAYROCK, MONITOR,
TAMARACK, HERCULES MINES,
Wallace, undergr, Pb, Ag, Zn
Gen Supt: C E Sparks
Prod: 400 tons
5 FLOT MILLS
Mill Supt: L A Grant
1 Mill Idle

DELMAR MNG & MLG CO

N 5018 Lincoln,
Spokane 19, Wash
Pres: Norman E Mills
VP: Adolph Oshert
Sec: Harry O Klaus
MINE, Salmon, undergr, Au, Ag
MINE Supt: Irvin Erickson
Under devel
23-TON GRAY MILL, at mine
(See Wash)

DOUGLAS MNG CO

P O Box 38, Kellogg
Pres: John D Bradley
VP: W G Woolf
Sec: Robert E Brown
DOUGLAS MINE, Pine Creek, 13
mi SW of Kellogg, Pb, Zn, Ag
Idle

FEDERAL URANIUM CORP

1370 S 3rd West St,
Salt Lake City, Utah
CONJECTURE, Lakeview
Landing, Bayview, Bonner County,
undergr, Au, Ag, Cu, Pb, Zn
Gen Mgr: R W Neyman
Gen Supt: L R Messerly
Geol-Ch Eng: R G Lindof
Under devel
(See Utah)

FORD ROCK MNG CO

Box 282, Fort Falls
MINE, Ferry County, Wash,
undergr
(See Wash)

GOLCONDA LEAD MINES

Scott Bldg, Wallace
VP & Treas: H F Magnuson
Sec: D H Camp
GOLCONDA MINE, 3 mi E of
Wallace, undergr, Pb, Ag, Zn
300-TON FLOT MILL, Mullian Rd,
Wallace
Gen Mgr: Wray Featherstone
Mill Supt: C E Bloom
Asst Mill Supt: Richard Holmberg
Assayer: Peter Mack
Idle

GOLDEN COPPER QUEEN MINE

410 Yellowstone Ave, Pocatello
Pres: H T Allen
VP: K M Pratt
Sec-Treas: C S Hale
GOLDEN COPPER QUEEN MINE,
Tendoy, undergr, Cu, Au, Ag
Gen Mgr: C S Hale
MINE Supt & Geol: H F Allen

MINE Fm: Clinton Green
Under devel
90-TON FLOT MILL, Tendoy,
not ore

GRANADA LEAD MINES, INC

Scott Bldg, Wallace
Pres: Ross Roundy
VP: Wray Featherstone
Sec: John Feasock
Treas: H F Magnuson
GRANADA MINE, 3 1/2 mi E of
Wallace, Pb, Ag, Zn
Gen Mgr: Wray Featherstone
Under devel

HECLA MNG CO

Box 330, Wallace
Pres: L J Randall
VP: J L McCarthy &
R E Sorenson
Sec-Treas: John R Matthews
Purch Agt: R G Hall
STAR MINE, Burke, undergr,
Zn, Pb, Ag
Mgr, Mines: William H Love
Ch Geol: H E Harper
Mech Eng: Harry Graff
Elec Eng: N Huhta
MINE Fm: William Dunphy
Ch Eng: Wallace Crandall
Prod: 800 tons
(Owned by The Bunker Hill Co)
800-TON FLOT MILL, Burke,
Zn, Pb
Mill Supt: James Hunter
Assayer: Thomas Hydran
(See Utah)

HIGHLAND-SURPRISE CONSOL MNG CO

Box 889, Oyd-Taylor Bldg,
Wallace
Pres: Henry C Smith
Sec-Treas: W A Callaway
HIGHLAND-SURPRISE MINE,
Kellogg, 15 mi SW of Kellogg,
undergr, Zn, Pb, Ag
Idle
300-TON FLOT MILL
Idle

HOLLY CORP

405 Lexington Ave,
New York, N Y
Pres: S B Harris
VP: Charles Chiusano
HERMES MINE, Yellow Pine,
undergr, Hg
Gen Mgr: James C Brassfield
MINE Supt: Joe Phelps
Prod: 150 tons ore
200-TON FLOT MILL, at mine
Mill Supt: Bob Payne
(See N Y)

HORN SILVER MNG & MLG CO

Box 1010, Wallace
Pres: Henry L Day
Sec-Treas: R W Anno
MINES, 3 mi S of Wallace, Ag,
Pb, Cu
Idle

HYPOTHEEK MNG & MLG CO

510 Bank St, Wallace
VP: Sig Torkelson
Sec & Gen Mgr: Roy H Kingsbury
OIL HYPOTHEEK & KING OF
PINE CREEK MINES, Kingston,
Au, Ag, Pb
Idle
(See Mont, Utah, Wash & King of
Pine Creek Mng Co, Idaho)

IDAHO CONSOL MINES INC

4109 Arcade Bldg,
Seattle 1, Wash
Pres-Purch Agt:
Edmund G Wilson
VP-Treas: Fred J Wettrick
Sec: Robert J McConnell
TWIN PEAKS MINE, Salmon,
18 mi S of Salmon on U S Hwy 93,
3 1/2 mi off Hwy at Twin Peaks
Bridge on Salmon River, Pb,
Cu, Ag, undergr
Gen Mgr-Gen Supt-Mine Supt:
Charles Kapp
Asst Gen Mgr-Asst Mine Supt:
Don E Nichols
Geol-Mine Eng:
Allen C Merritt
Prod: 100 tons per day
150-TON MILL, at mine
Mill Supt: Don E Nichols

IDAHO CUSTER SILVER-LEAD MINES, INC

Box 469, Wallace
Pres: Alvo V Alvensleben

VP: O Miller
Sec & Treas: H F Magnuson
LIVINGSTON MINE, 14 mi S of
Clayton, Pb
300-TON MILL
Idle

IDAHO GARNET

ABRASIVE CO
707 W 5th, Spokane, Wash
Own: Lowell Thompson
Gen Mgr: Harry Trumbo
IDAHO GARNET, placer, garnet
Supt: Herschel Tripp
Asst Supt: Charles Kimball
100-TON MILL
Emerald Cr Siding

IDAHO MNG & MFG INC

504 10th Ave, Lewiston
Pres: Philip W Jungert
VP: Karl R Saxmon
Sec-Treas: Marion G Jungert
FLORENCE BASIN PLACERS,
Fluorine, placer, Au, Ag,
monazite, Ti, Zr, Radio
Active Black Sands
Gen Mgr & Mine Supt:
Philip W Jungert
Gen Supt & Asst Mine Supt:
Marion G Jungert
Under devel

INSPIRATION LEAD CO

W 900 Sprague Ave,
Spokane 4, Wash
Pres: E H Carlson
VP-Sec-Treas & Gen Mgr:
W T Anderson
Purch Agt & Asst Gen Supt:
R H Wellman
INSPIRATION SILVER ORE
MINE, Box 225, Wallace,
Dago Gulch, Osburn, undergr,
Pb, Ag, Zn
Mine Supt: Elmer Keithauer
Under devel
(See Utah)

IRON MT MNG CO, INC

Box 848, Weiser
Pres: Eugene C Netrich
VP: John Lloyd
Sect: Barbara Crowell
MORTIMER GROUP, 30 mi N of
Weiser, undergr, Pb, Ag, Cu,
Zn, Au
Idle

ISBELL CONST CO

Box 2251, Reno, Nevada
BLACKBIRD MINE, P O Box 15,
Cobalt, contract mag for
Calera Mng Co, Cobalt
Supt: Ted Macintosh
Eng: A Lee Longfield
(See Ariz, Nev, Utah, Wash)

KERN COUNTY LAND

COMPANY
Consulting Geol representing
Kern County Land Company
David L Moore, 405 McCarty
Bldg, Boise
Mgr, Minerals Dept:
Wm T Griswold
(See Ariz, Calif, Utah)

KINSELLA & LAMBETH

John Day, Oreg
WEBSTER ROCK CORK MINE,
Haley, open pit, rock cork
Mine Supt: Jim Kinsella
Idle
(See Oreg)

KUBESH, JAMES E

1622 9th Ave, Sweet Home,
Oreg

DUTCH MILL, FREE GOLD

MINES, Pierce dist,
Clearwater County, Au, rare
earth, undergr, placer, open
pit
Gen Mgr: Kenneth White
Idle
35-TON GRAV MILL, Pierce
dist
REFORT FURNACE

LEONARD BROTHERS

Silver City via Murphy,
Owyhee County
Mgr: F L Leonard
Part: Richard M Leonard
PAUPER GROUP, 2 mi SE of
Silver City, undergr,
Au, Ag, Cu
2-TON GRAV-ANAL MILL, at
mine
Idle

LEONARD, MRS B H

Silver City via Murphy
DAVIDSON GROUP, 2 mi E of
Silver City, undergr, Au, Ag
Idle
EMPIRE GROUP, 2 1/3 mi E of
Silver City, undergr, Au, Ag
Idle

LONE PINE MINING CO

INC
407 N 11th St, Boise
Pres: Don Ruess
VP & Gen Mgr: Gus Darland
Sec: Ralph Paulson
Treas: Dale Bell
LONE PINE, Ten Mt District,
Golden, undergr, Au
Gen Mgr: Gus Darland
Under devel
50-TON FLOT & GRAV MILL,
to be installed, Golden

LUCKY FRIDAY SILVER-

LEAD MINES CO
Box 320, Wallace
LUCKY FRIDAY MINE, Mullan,
Humboldt dist, Pb, Ag, Au, Cu,
Zn
Pres: 150 tons
Mine Supt: David Elder
(Control & operations by Hecla
Mng Co)

LUCKY GEM MNG & MFG

CO INC
8 O Box 245, Emmett
Pres: C O Box 245, Emmett
VP: Olive Adams
Sec-Treas: Ray N Adkins
LUCKY GEM MINE, open pit,
Au, Ag, Platinum, U₃O₈
Genl: O T Hansen
Mech Eng: George Dodge
Mine Supt: Carl W Tillman
Under devel

MARR, FRANK H

611 Peyton Bldg, Spokane,
Wash
BUNKER HILL (Isabel), Box 920,
Kellogg, undergr, Pb, Ag, Zn
Gen Mgr: C F Redding
Mine Frm: Milton Turkey
Prod: 30 tons
150-TON FLOT MILL, Wardner

MASCOT MINES, INC

Box 989, Kellogg
Pres: Malcolm C Brown
VP & Purch Agt: Dunham Bell
Sec-Treas: H F Magnuson
LITTLE PITTSBURGH MINE,
Pine Creek, Kellogg, undergr,
Au, Pb, Ag
Idle
150-TON FLOT MILL, Pine Cr
Idle
(See Utah)

METALINE & PINE

CREEK CONSOL MNG CO
Scott Bldg, Wallace
Pres: Stanley Easton
VP: J M Hoffman
Sec: L J Randall
Asst Sec: H F Magnuson

METROPOLITAN MINES

CORP, LTD
510 Bank St, Wallace
Pres & Mgr: Roy W Kingsbury
Sec-Treas: A J Tenke
METROPOLITAN GROUP,
Shoshone County, Ag, Pb, Cu
(Under devel by Sunshine Mng
Co)
(See Black Bear Silver-Lead
Mines, Inc)

MONSANTO CHEM CO

INORGANIC CHEM DIV
Soda Springs
Plant Mgr: R R Rumer
Prod Supt: F N Crouse
Maint Supt: F F Hendrickson
Plant Buyer: G F Dupin
Personnel Supt: S H Styles
BALLARD MINE, 12 mi N of
Soda Springs, open pit, phosphate
rock
Mine Supt: G L Atwood
MILL, 1 mi N of Soda Springs,
rotary kiln
Mill Supt: T V Kromer
Asst Mill Supt: D L Gillette
ELECTROLYTIC SMELTER, 2
mi N of Soda Springs
Supt: J H Connar
(See Mo, Tenn)

MONTANA COAL & IRON

CO
Washoe, Mont
BLACK PINE MINE, Blackbird
dist, Lemhi County, Ag, Cu
Idle until spring

MULLAN SILVER-LEAD

CO
Scott Bldg, Wallace
Pres: J E McKay
VP: James Doyle, Jr
Sec-Treas: H F Magnuson

NABOB SILVER-LEAD CO

Box 889, Kellogg
Pres: H J Hall
VP, Gen Mgr & Purch Agt:
C C Donkin
Sec-Treas: June H Olson
NABOB SILVER-LEAD CO MINE,
Pine Cr, undergr, Zn, Pb
350-TON FLOT MILL
Mill Supt: E M George
Idle

NATIONAL URANIUM

CORP
310 Bank St, Wallace
Pres & Gen Mgr:
John T Kingsbury
Sec & Agent: Roy H Kingsbury
CLAIMS, LITTLE JOE MINE,
Reynolds County, Mont, U₃O₈
Under devel

NORTH FORK MNG CO

Box 448, Wallace
VP: Vernon J Robinson
Sect: Earl Chilcott
MINE, 18 mi N of Wallace
Idle

NORTHWEST MINERALS

INC
730 Peyton Bldg, Spokane 1,
Wash
Pres: Forrest M Garrett
VP: H E Beely
Sec-Treas: Don A Gillis
HUNTER-CONTINENTAL
MINE, Pinehurst, undergr, Pb,
Ag
Gen Mgr: H E Beely
Geol: H Gratton Lynch
Idle (assessment work only)
(See Wash)

NUCLEAR FUELS & RARE

METALS CORP INC
Pocatello
Pres: D B Lewis
MINE, in Lemhi Pass area on
Continental divide between
Idaho & Mont, Th, Co, Ta,
Rare Earths
Under devel
(See Mont)

OXFORD COPPER MNG

CO LTD
221 First St, Orofino
Pres: A B Curtis
VP, Purch Agt & Gen Mgr:
Robert Oud
Sec & Treas: Carroll Brock
MINE, undergr, Cu, Au
Idle
MILL, near Pierce

PAYMASTER, INC

611 Peyton Bldg,
Spokane 1, Wash
Pres: Frank N Marr
Sec: C D Randall
MINE, 31 mi SW of Arco,
undergr,
Idle

PHILLIPS PETROLEUM

CO
Box 2178, Boise
Pres: Paul Endacott
Sec: Paul J Parker
Idaho Agt: Frank Martin Jr
MINE, Little Bill Group in
Cold Cr in Stanley Basin,
Custer County, Claims
leased from Bill Brooks, Melvin
Peterson & Jules Kauffman,
Haley
Under devel

POLARIS SILVER

SUMMIT MINE
Box 338, Wallace
Pres: L J Randall
VP: George Zeller
Sec-Treas: J H Matthews
Purch Agt: R G Hull
SILVER SUMMIT MINE, 7 mi
W of Wallace, undergr, Ag, Cu
Mgr of Mines: William H Love
Mine Supt: George Grismer

Mine Frm: A P MacDonald
Ch Geol: H E Harper
Prod: 150 tons
300-TON FLOT MILL, Polaris
Mill Supt: J H Hunter
Mill Frm: Wm Behn
(See American Silver Mng Co,
Hecla Mng Co, Idaho)

PORTER BROS CORP

Box 687, 2500 Warm
Springs Ave, Boise
Pres: R P Porter
VP & Sec-Treas:
D L Skidmore
Purch Agt: D L Runft
DEAR VALLEY PLACER, at
Dear Valley, Valley County,
placer, columbium, tantalum,
uranium, monazite, rare
earths
300-TON GRAV MILL,
Lowman
Mill Supt: A L Reese

PRINCETON MNG CO

Scott Bldg, Wallace
Pres: H J Hall
VP: J Y Grismer
Sec-Treas: H F Magnuson
MINE, E of Mullan
Under devel

RAINBOW MNG & MFG

CO LTD
Box 568, Wallace
Pres: H C Mooney
Sec-Treas: W A Callaway
RAINBOW #1 GROUP, Evolution
dist, Cu, Ag, Pb, Zn
Under devel by Polaris Mng
Co

RARE METALS CORP OF

AMERICA
1st Security Bldg, Salt Lake
City 11, Utah
VP: M H Kline
IDAHO-ALMADEN MINE, Box
627, Weiser, Washington
County, open pit, U₃O₈
Mine Supt: H W Horst
Offic Mgr: Jerry Sugen
Prod: 175 tons
175-TON ROTARY KILN MILL,
Weiser
Mill Supt: H W Horst
(See Ariz, N Mex, Utah)

RICHARDSON PLACERS

Box 756, Salmon
Gen Mgr: G E Shoop
RICHARDSON PLACERS,
Lewburg, placer, Au, Ag,
petrified wood opified
Prod: (in summer only)
placers - 1,000 yds
MILL, hydraulic & sluice

RICHLAND MINES INC

P O Box 5643, Boise
Pres: Henry L Johnson
VP: Martin Newman
Sec-Treas: William Olson,
203 Idaho Bldg, Boise
RICHLAND GROUP,
Placerville, undergr, Ag, Pb,
Au, Zn
Idle

ROOD PLACER

Shoop
Own: Frank H Rood
Sec: Hazel Rood
MADELL MINE, placer, Au
Under devel

ST PAUL LEAD CO

c/o James G Towles,
Sidney Bldg, Kellogg
SNOWSHOE & ST PAUL MINES,
Ag, Pb, Zn
Under devel
(See Mont)

SALMON RIVER

SHEELITE CORP
Clayton
Pres: Harvey Penny
VP: Larry P Nunnkamp
Sec-Treas & Gen Mgr:
James E Clutis
Asst Gen Mgr: D P Leimons
TUNGSTEN JIM MINE, Clayton,
Thompson Cr, undergr, WO₃
Mine Supt: George Wilcox
Prod: 45 tons
Under devel
40-TON GRAV MILL, at mine

SAN FRANCISCO

CHEMICAL CO
Montpelier
Pres: D L King
VP: Max L Sealman &

W Jerome Taylor
Purch Agt: Calvin P Sims
WATERLOO MINE, E of
Montpelier, open pit,
phosphate
Gen Supt: Charles C Stephens
Mine Supt: Lorraine F Jacobson
(See Utah, Wyo)

SAWLOG MNG

Shoup
Gen Mgr: Magnus Bevan
Sec: Hazel Bevan
TWILIGHT MINE, undergr &
surface, Au, Ag, Pb
Under devel
5-TON GRAV MILL, at mine

SIDNEY MNG CO

100 Sidney Bldg, Kellogg
Pres: M C Brown
Sec-Treas: F E Marler
Gen Supt: C A McKinley
Purch Agt: A G Phipps
SIDNEY MINE, 15 mi S of
Kellogg, undergr, Zn, Ag, Pb
Prod: 200 tons
300-TON FLOT MILL, Pine Cr
dist
Supt: C A McKinley

SIGNAL MNG CO

410 Main St, Kellogg
Pres: H G Alway
VP: John B Penny
Sec: Wendell R Brainard
HILARITY GROUP, 7 mi W of
Kellogg, undergr, Zn, Pb, Ag
Idle

SILVER BUCKLE MNG CO

Box 1088, Wallace
Pres: Dr F E Scott
VP & Gen Mgr: Clark L Wilson
Sec-Treas: Alden Hall
Office Mgr: Jack D Galy
SILVER BUCKLE-VINDICATOR
PROJECT, Wallace & Mullan,
Pb, Ag
Idle
(See Utah, Wash)

SILVER DOLLAR MNG CO

900 W Sprague Ave,
P O Box 122, Spokane 10, Wash
Pres: Elmer E Johnston
VP: L E Nicholas
Sec-Treas: W T Anderson
Purch Agt: W J Carlson
SILVER DOLLAR MINE, Osburn,
undergr, Pb, Ag
Geol: P E Ocasarson
(See Wash)

SILVER STAR MINES, INC

314 High Bank St, Wallace
Pres-Purch Agt-Gen Mgr:
Philip G Anderson
VP: Phyllis McKinnis
Sec: Pearl W Benson
SILVER STAR MINES, undergr,
Under devel

SILVER STAR-QUEENS

MINES, INC
Box 154, Haley
Pres: Carlfield Vogt
VP: Edward B Riley
Sec-Treas: J McFadden
Purch Agt: M F Sobala
OLD MINNIE MOORE & QUEEN
OF THE HILLS MINES, 1 mi W of
Bellevue, undergr, Pb, Ag, Zn
Gen Mgr & Supt: Roy T Pitt
Under devel

SILVER SYNDICATE, INC

Scott Bldg, Wallace
Pres: W M Yeaman
VP & Gen Mgr: N M Smith
Sec-Treas: Ray Morrison
SILVER SYNDICATE MINE, 10
mi from Wallace, undergr, Cu,
Pb, Zn, Ag, antimony
Prod: 100 tons per day
Operated by Sunshine Mng Co

J R SIMPLOT CO

Continental Bank Bldg, Boise
Pres: J R Simplot
VP: W Grant Kilburne
Treas: John M Dahl
Sec & Asst: Lloyd E Haght
Mgr of Mines: George A McHugh
Staff Geol: Joe Jeannette,
S A Robinson
Asst Mgr Explor Div:
C W Sweetwood
Salty & Perot: Hugh D Larkin
Traffic Mgr: Vern J Tannard
FERTILIZER DIV, Box 913,
Pocatello
Gen Mgr: W Grant Kilburne

GAY MINE, near Fort Hall, open pit, phosphate
Res Mgr: O E Pothier
Mine Supt: John Clouser
Geol: Norman Lehman
Mine Frm: Tom Hughes
Mine Eng: Robert Hill
Prod: 10,000 tons
FERTILIZER PLANT, Pocatello
Plant Eng: R L Long
Chem Eng: Oscar C Finkelsberg
Auditor: William Hahn
FLUORSPAR DIV, Challis
Inactive
(See Mont, Nev)

GOOSE MNG CO
219 N 17th St, Boise
Pres: W F Smith
VP: Mrs A M Jensen
Sec-Treas: R S Hansen
GOOSE MINE, 2 1/2 mi SE of
Halley, undergr, Zn, Pb, Ag
Idle

SOLAR-X CORP
8045 Ustick Rd, Boise
Pres & Purch Agt:
Kenneth Arnold
VP: W E Thalman
Sec: Theodore T Hardy
Treas: T C Brown
(See Ore)

SPOKANE-IDAHO MNG CO
611 Peyton Bldg, Spokane I,
Wash
Pres: Frank N Marr
Sec: C D Randall
Treas: Charles E Marr, Jr
CONSTITUTION MINE, 9 1/2 mi
SE of Pinehurst, undergr, Zn, Pb
Idle
(See Wash)

SUCCESS MNG CO, LTD
Wallace
Pres: Henry L Day
SUCCESS MINE, Wallace, Zn,
Pb
Idle

SUNGOLD MINES INC
711 Hutton Bldg, Spokane, Wash
Pres & Mgr: W T Putman
SUNGOLD MINE, Grangeville,
undergr, As
Idle

SUNSET MINES, INC
P O Box 5157, 1400 W 52nd St,
Seattle 7, Wash
SUNSET MINE, Shoshone County,
undergr
(See Wash)

SUNSHINE CONS, INC
103 Sidney Bldg, Kellogg
Pres: W M Yeaman
VP: Ray Morrison
Sec & Treas: F E Marler, Jr
Gen Mgr: N M Smith
SUNSHINE CONS MINE, 6 mi E
of Kellogg, undergr, Ag
(Under devel by Sunshine Mng Co)

SUNSHINE MNG CO
738 Peyton Bldg, Spokane I,
Wash
Pres: Robert M Hardy, Jr
VP: C M Hull
Sec: Stanton B Bennett
Treas: Vincent P Whelan
Purch Agt: N J Osborne
Mgr, Mng Div: John Edgar
Mgr: Petroleum Div: A P Wynn
SUNSHINE MINE, Box 1080,
Kellogg, undergr, Ag, Pb, Cu,
Sn
Mgr: H B Johnson
Ch Geol: James B Colson
Ch Eng: James C Durham
Mine Frm: Charles A Angle
Prod: 750 tons
1,000-TON FLOT MILL
Mill Supt: Franklin H Sharp
Asst Mill Supt: Leon N Barr
Mill Frm: Lyle Torrell
Antimony Plant Frm:
Harold Palmer
SILVER SYNGRATIC MINE
(See Silver Syn Mng Co)
SUNSHINE CON MINE
(See Sunshine Cons)
(See Fairview Placers, Calif)
(See Ariz, Utah, Wash)

TIN CUP MINE
1 mi from Yellow Jacket,
Yellow Jacket Dist, Cobalt,
undergr, Au, Ag, Cu
6-TONS FLOT-GRAV MILL
Own & Oper: Hugo A Sind

TREASUREMENT MNG CO
1129 10th Ave N, Seattle, Wash
Pres & Gen Mgr: W J Logus
Sec & Treas: M A Logus
QUINLEY MINE, 9 1/2 mi E
of Halley, undergr, Pb, Ag
Geol: James M McDonald
Mine Supt: Al Linderman
Idle

UNITED IDAHO MNG CO
808 Newhouse Bldg, Salt Lake
City, Utah
Pres & Gen Mgr: Roger V Pierce
UNITED IDAHO MINE, Gilmore,
undergr, Pb, Ag
Idle

**URANIUM EXPLORATION
CORP OF IDAHO**
291 Main Ave E, Twin Falls
Pres: Bert A Sweet, Sr
VP: Emmett Kelly
Sec-Treas: Leonard Mauss
UREKO MINE, Custer County,
North Fork Lost River, 37 mi
from Ketchum, U₃O₈
Under devel

WAR EAGLE MNG CO, INC
114 E Chestnut St, Yakima,
Wash

WAR EAGLE MINE, McCall,
undergr, Au, Ag
Gen Mgr: E W Peterson
Idle
75-TON HEAVY MEDIA MILL,
McCall
(See Wash)

**WESTERN FLUORITE MNG
CO INC**
Box 455, Halley
Pres: Henry S Childs
VP: Wilson Hawkins
Sec-Treas: Tom Halley
MINE, Eastern Basin Cr area,
Stanley Basin, Custer County,
Claim leased from Keith &
Alice Evans, Ketchum, open pit,
U₃O₈
Supt: Henry C Childs
Under devel

WHELCHER MINES CO
1019 Arthur St, Caldwell
Pres: William E Whelchel
VP: Ralph A Whelchel
Sec-Treas: Theresa M Whelchel
TWIN BUTTES GROUP #1,
Owyhee County, Box 7, Caldwell,
rare earth, gypsum
Under devel
(See Nev, Utah)

WHITE KNOB MNG CO
1019 Newhouse Bldg, Salt Lake
City, Utah
Pres: O A Glaeser
HOMESTAKE, COPPER QUEEN
MINES, Alder Creek, Mackay,
Pb, Zn, Ag

**WHITEDELF MNG &
DEVEL CO**
401 Empire State Bldg,
Spokane I, Wash
Pres-Purch Agt:
Compton I White
VP: H G Loop
Sec-Treas: E I Fisher
WHITEDELF MINE, Clark Fork,
Pb, Ag, Zn
Gen Mgr-Mine Supt:
Compton I White
100-TON-MILL, Clark Fork,
Idaho
(See Wash)

YREKA UNITED INC
Kellogg
Pres: Wendell R Brainerd
VP: Henry C Smith
Sec-Treas: C Whelan
MINE, merged group,
including properties of Altura,
Hill, Mohawk Silver-Lead,
Paramount, Yreka, California
Silver-Lead, Lead Bloesom,
New Hilarity, United Mines Mng
Co, an upper Elk Cr, SW of
Kellogg, Shoshone County
Sited for deep-level devel by
The Bunker Hill Co, under
operating agreement

ILLINOIS

ALUMINUM CO OF
AMERICA

1901 Alcoa Bldg, Pittsburg 19,
Pa
Pres: F L Magee
VP: L Litchfield, Jr
Sec: A M Hunt
Treas: E B Walter
Purch Agt: E O Keefer
Gen Mgr, Raw Materials Div:
George W Streeby
FAIRVIEW-BLUE DIGGINGS,
Rosiclare, CaF₂, Pb, Zn,
undergr
Works Mgr: W S Sheets
Geol: F E Williams
Mech Eng: H E Eder
Purch Agt: T H Fallwell
Works Ch Mng Eng:
S G Busman
Mine Supt: W H Harrison Jr
Prod: 400 tons per day
488-TON-FLOT-HEAV-MED-
MILL, Rosiclare
Mill Supt: W C Lay
Asst Mill Supt: T K Loyd
(See Ark, Ky, Pa)

AMERICAN COLLOID CO
3100 Safford Court, Skokie
Pres & Gen Mgr: Paul Bechtner
VP & Treas: W D Weaver
VP: E F Weaver
VP: Clyde A Sanders
Asst Sec: Jeanette Dixon
Purch Agt: Roy H Harris
(See Miss, S Dak, Wyo)

**AMERICAN SMELTING &
REFINING CO**
Federal
FEDERAL SMELTER, Pb
Mgr: L J Buck
Supt: James H Voss
(See Ariz, Calif, Colo, Idaho,
Md, Mont, Neb, N J, N Mex,
N Y, Okla, Tex, Utah, Wash and
Federal Mng & Smelting Co, Mo)

**AMERICAN ZINC CO OF
ILLINOIS** (Subsidiary of
AMERICAN ZINC, LEAD
& SMELT CO)
1515 Paul Brown Bldg, St
Louis I, Missouri
SMELTER, Fairmont City,
Roasting & by-product plant
VP & Gen Mgr: G L Spencer, Jr
Gen Supt: George Kromen
Purch Agt: O E James
ELECTROLYTIC SMELTER,
Monsanto
Mgr: L P Davidson
Gen Supt: T I Moore
Purch Agt: V M Provov
Prod: 54,000 tons hi-grade
slab zinc annually

**SMELTING & PROCESSING
PLANT**, Hillsboro
Mgr: H R Wampler
Met Div Supt: J F Clark
Gen Frm: H J Collett
Oxide Supt: Oscar Hassel
Assay: Orville Rutledge
Prod: 12,800 tons Amer prod
slab zinc yearly
2,700 tons Fr prod slab
zinc yearly
7,150 tons slab zinc yearly
(See Ariz, Mo, Okla, Ohio,
Tenn, Tex, Wash, Wisc)

CALUMET & HECLA, INC
1235 Michigan Ave,
Chicago 3
VP: H Y Bassett
VP-Finance: C C Jung
Sec: A E Poteremann
Treas: F J Gibbons
(See Mich, N Mex, N Y)

THE CELOTEN CORP.
HAMILIN DIV
120 La Salle St, E, Chicago
MINE, Longworth, Fisher
County, Texas, Gypsum
(See Tex)

**EAGLE PITCHER CO, MNG
& SMELTING DIV**
Box 1040, Galena
GRAHAM MINE, Galena,
undergr, Zn, Pb
Gen Mgr: R L Haffner
Gen Supt: H H Haman
Geol: Wm J Arndt
Maint Supt: T A Ray
Molnt Frm: Clarence Lyden
Mine Supt: E L Hoyt
Mine Frm: Harold Wisco

Mine Eng: W B Farvey
Prod: 1,500 tons
GRAHAM MILL, Galena, flint
& grav
Mill Supt: C C Crow
Mill Frm: Glen Brotsman
Assayers: Ed O'Neil &
Richard Simmons
Prod: 1,500 tons of Zn daily
(See Kans, Nev, Ohio, Okla,
Wisc)

EGYPTIAN MNG CO
Rosiclare
MINE, Pope County, CaF₂

GOOSE CREEK MNG CO
10 Public Square, Belleville
Sec-Treas: C D Blair
MINE, near Cave-In-Rock, CaF₂

HOEB MNG CO
Cave-In-Rock
Pres: P A Hill
VP: B W Bales
Sec-Treas & Gen Mgr:
Lowell Oxford
Purch Agt: Carl Embree
HOEB MINE, undergr, CaF₂
Pb, Zn
Gen Supt: Ray Crabbe
Gen Mgr-Geol: Lowell Oxford

INLAND STEEL CO
36 W Monroe, Chicago 3
Pres: Joseph Block
VP, Raw Materials:
P D Block Jr
Sec: Graydon Megan
Treas: W H Lowe
(See Mich, Minn)

**INTERNATL MINERALS &
CHEMICAL CORP**
CONSOL FELDSPAR
DEPT
Old Orchard Rd, Skokie
Pres: Thomas M Ware
VP, Ind Min Div:
Norman J Dunbeck
Mgr, Consol Feldspar Dept:
E W Koenig

Asst Mgr: Phil Blaxovic, Jr
VP: G W Moyers, M H Lock-
wood, P D V Manning,
George Hamilton,
N J Dunbeck, N C White
VP & Treas: A R Cahill
VP & Gen Counsel:
E D McDougal, Jr
Corp Sec: C M Edwards
Purch Agt: J P Burrows
(See Ariz, Colo, Fla, Maine,
Miss, N Mex, N C, S D, Tenn,
Va, Wyo)

**KEYSTONE FELDSPAR &
CHEM CO**
230 W Huron St, Chicago
(See S D)

**MATTHIESSEN &
HEGLER ZINC CO**
LaSalle
LaSALLE WORKS, Zn
Pres: H D Carus
VP: C R MacBrayne
Sec: E H Carus
Treas: W Schooning
Purch Agt: A La Flamme
Gen Supt: R Waszkowski
Mech Engr: H Larson
Safety Engr: V Novak
Purch Engr: A La Flamme
SMELTER (Retired)
Capacity: 32,000 tons Zn per yr

MINERVA OIL CO.
FLUORSPAR DIV
Div'n Off: Myers Bldg, Box
531, Eldorado

VP & Gen Mgr:
Gull Montgomery
Purch Agt & Sls Mgr:
E J Kelly
MINERVA MINE NO 1,
Cave-In-Rock, undergr, CaF₂,
Zn
Mine Supt: C F Callahan
Mine Frm: James Charlton
Eng: D B Heitbrink
Mng Eng: J J Daly
Geol: Donald W Saxby
Plant Mgr: O E Anderson
Prod: 225 tons per day
35-TON FLOT MILL: CaF₂,
Zn conc
Mill Supt: Wm Rule
Chem: C B Raab
Assayers: A C Reed
CRYSTAL MINE, Rt 1,
Elizabethtown, undergr, CaF₂
Plant Mgr: I V Robertson
Mine Frm: Raynard Dutton

Prod: 500 tons per day
750-TON HMS and FLOT MILL,
met, grade & acid grade
fluorspar:
Crystal Mill: Acid & Ceramic
& met fluorspar; zinc & lead
concentrate
Mill Frm: Jas Frailey
Melt: D C Spees
VICTORY MINE, Rt 1,
Elizabethtown, undergr, CaF₂
Idle
JEFFERSON MINE, Rt 4,
Golconda, undergr, CaF₂
Mine Frm: Ray Stone
Prod: 80 tons per day
ROSE CREEK MINE, near
Hered, undergr, CaF₂
Idle
DENSON MINE (lease) Rt #1,
Elizabethtown, undergr, open
pit, CaF₂
Prod: 100 tons per day
GASKINS MINE, Empire dist,
Pope County, undergr, CaF₂
Idle
(See Mo)

OSARK-MAHONING CO.
MNG DIV
Box 37, Rosiclare
Pres: C O Anderson
VP & Gen Mgr: A G Johnson
Purch Agt: C W Sobosky
DEARDORFF, W L DAVIS #2,
NORTH GREEN, EAST GREEN,
MAHONING MINES, SHAFT #3,
3, 5, 11, 18 & HILL-LEDFORD,
undergr, fluorspar, Zn, Pb
Mine Supt: Edward Powell, Jr
Asst Mine Supt: Wm H Melcher
Mine Frm: J H Scott, J L Price
Prod: 300 tons
500-TON FLOT MILL, at mine
Mill Supt: W W Fowler
Asst Mill Supt: R H Herman
Mill Frm: P N Hobbs
Assay: Wm Smith
(See Colo, N Mex, Okla)

**ROSLICLARE LEAD &
FLUORSPAR MNG CO**
Rosiclare
Pres: J Blecholson
VP: Bruce Baird
Sec-Treas: Herman G Lauten
Cashier: R A Browning
ROSLICLARE MINE, undergr,
fluorspar
Master Elec: P E Howard
Frmt: 300 tons
Idle
350-TON-FLOT-HEAV-MED
MILL, at mine
(See Ky)

MORTON SALT CO
110 N Wacker Dr, Chicago
Pres: Daniel Peterkin
VP: Herbert Stratford
Sec-Treas: Garfield King
Purch Agt: D M Conway
FAIRPORT HARBOR MINE,
Box 390, Painesville, Ohio,
undergr, Rock salt
Gen Mgr: Russell Osmond
Asst Gen Mgr: Dean McCormick
Office Mgr: Ralph Oliver
Mine Supt: M R Barker
Under devel
Prod: 2050 tons
(See Kan, La, Ohio, Tex)

NEW JERSEY ZINC CO.
THE
Box 129, Harrisburg
Res Geol: E L Weinberg
(See Colo, N J, N Mex, N Y,
Pa, Tenn, Va, Wisc)
**SOUTHERN ILLINOIS
MNG CO**
439 S Spring, Los Angeles,
California
Prop: H E Roberts
MACKEY-HUMM, JEFFERSON-
HUMM MINES, Rosiclare, Ill.,
undergr, CaF₂
Gen Mgr: A C Dorensfeld
Asst Gen Mgr: R D O'Brien
Gen Supt: H C Morrison
Mine Supt: B J Spire
Mine Frm: L Austin
Telford
Mine Eng: W Fulghum
Prod: 100 tons daily
DOUGLAS MINE, Pope County
350-TON FLOT MILL,
Rosiclare, Ill.,
heav-med, CaF₂
Mill Supt: J C Shoemaker
(See Cal)

Massachusetts

SWIFT & CO
Union Stock Yards, Chicago
(See Fla)

TRI-STATE ZINC, INC
133 Williams St., New York 36,
N.Y.
Pres: R F Playter
VP: V C Allen
Sec-Treas: J H Nicholls
GRAY MINE OPERATION,
Galena, undergr., Zn, Pb
Gen Mgr: V C Allen
Cons: Paul Herbert, Jr.
Mine Supt: Joseph J Holan
Mine Frm: Orville W Lickas
Mine Eng: S J Kuchnerman
Prod: 1,000 tons
1,300-TON FLOT-GRAB MILL,
Galena
(See N.Y., Va)

U S GYPSUM CO
300 W Adams St., Chicago 6
Chas: Ed C Huxner
Pres: G M Woods
VP: Op: E Rembert
VP, Manufact: C W Deagrey
VP, Purch: H C Bear
Sec-Treas: F L Stellner
Mgr Mines: F C Appleyard
(See Calif., Colo., Conn., Ind.,
Iowa, Mass., Ohio, S.D., Tex.,
Utah, Va)

**VICTOR CHEMICAL
WORKS**
150 N Wacker Dr., Chicago 6
Pres: Retha Weigl
VP: F M Amble, T G Everett,
H N Bunkley
Sect: F W Hansen
Treas: F S Schwertli
Purch Agt: M E Jones
(See Fla., Minn.)

ZEONOLITE CO
135 La Salle St., Chicago
Pres: John B Myers
VP: Dayton L Prosty,
Daniel J Boono, Joe A
Kelley, Robert W Sterrett
VP & Treas: Walter J Bein
Sect: J H Bishop
Purch Agt: Leo O Franz
(See Mont.)

INDIANA

NATIONAL GYPSUM CO
335 Delaware Ave.,
Buffalo 2, N.Y.
MINE, Shoals, undergr., gypsum
Pl Mgr: M B Turner
Mine Supt: Max Abrams
Prod: 1,300 tons
MILL, at mine
(See Iowa, Kans., N.Y., Tex., Va)

U S GYPSUM CO
300 W Adams St., Chicago 6,
Ill.
MINE, Shoals, undergr., gypsum
Works Mgr: J R Burns
(See Calif., Colo., Conn., Ill.,
Iowa, Mass., Ohio, S.D., Tex.,
Utah, Va)

IOWA

**BALD MOUNTAIN MNG
CO**
Clinton
Pres: O D Collins
Treas: W H Rutledge
Asst Treas: Mildred Slavens
(See S.D.)

BESTWALL GYPSUM CO
Fort Dodge
MINE & PLANT, gypsum
(See Kansas, N.Y., Pa., Tex.,
Utah)

NAT'L GYPSUM CO
Fort Dodge
QUARRY & PLANT, gypsum
Plant Mgr: J B Pitts, Jr.
Mine Supt: Wm Canney
Prod: 1,000 tons
(See Ind., Kans., N.Y., Tex., Va)

U S GYPSUM CO
300 W Adams St., Chicago 6,
Ill.
OPEN QUARRY, Ft Dodge,
Iowa
Works Mgr: M E Davidson
(See Calif., Colo., Conn., Ill.,
Ind., Mass., Ohio, S.D., Tex.,
Utah, Va)

KANSAS

B & I MNG CO
Box 266, Picher, Okla
FLORENCE HARTLEY MINE,
Zn, Pb

BARTON SALT CO
1st National Bank Bldg.,
Hutchinson
Pres: C H Humphreys
VP: R S Humphreys
Sec: C R Allan
Treas: Elizabeth H Summers
THE BARTON SALT PLANT,
Cleveland & Campbell,
hydraulic mgg, salt,
Gen Mgr: R C Lindell

BESTWALL GYPSUM CO
130 E Lancaster Ave.,
Ardmore, Pa
MINE, Blue Rapids, undergr.,
gypsum
(See Iowa, N.Y., Pa., Tex., Utah)

CAREY SALT CO
Box 913, Hutchinson
Pres: H J Carey, Jr.
VP: W D P Carey
VP, Oper: S B Horrold
Sect: D F Johnson
Treas: R N Apple
Purch Agt: F L Johnson
MINE, Hutchinson, undergr.,
salt
Gen Mgr: Leo Reid
Mech Eng: Ron Stone
Mine Supt: Everett Roberia
Prod: 1,000 tons
MILL, Hutchinson
Mill Supt: C Millard
(See La)

**EAGLE PITCHER CO, MNG
& SMELT DIV**
Cardia, Okla.

**LUCKY JEW, BIG JOHN
DILHARD, GRACE B, WEBBER,
WESTSIDE, BALLARD,
HARTLEY, SHANKS, KEITH,
SWALLEY, SMITH, CLARK
MINES, undergr., Zn, Pb
LEAD SMELTER & ACID PLANT,
Galena
Idle
Mgr: Fred Clearman
(See Ill., Nev., Ohio, Okla., Wis.)**

INDEPENDENT SALT CO
4115 Packer Ave., Chicago, Ill.
SALT MINE, Kanopolis, undergr

**KERFORD, GEO W
QUARRY CO**
415 Utah Ave., Atchison
Pres: Geo Ed Kerford
VP-Treas: Lloyd Derford Jr.
Sect: Orlando Barnett
Chas of Ed Lloyd Kerford
UNDERGROUND WORKINGS,
undergr., open pit, limestone,
Gen Supt: Frank Lovell
Supt of Maint: J N Hicks
Prod: 300 tons per day

MARK TWAIN MNG CO
Picher, Okla
Supt: Harold Childress
MINE, undergr., Zn, Pb
Idle
(See Okla.)

McCoy & Carey MNG CO
612 River St., Picher, Okla
BONNY BOY MINE 2 mi SW of
Baxter, Pb, Zn
Idle

**MID-CONTINENT LEAD &
ZINC CO**
1004 1/2 Military, Baxter
Springs
Pres: Kenneth Childress
MINES, WRIGHT LAND GROUP
AND JARRETT MINE
Idle

MORTON SALT CO
130 N Wacker Dr.,
Chicago 6, Ill.
SALT MINE, Hutchinson,
evapor salt
Gen Plant Mgr: R E Berry
Asst Plant Mgr: D E Bucher
(See Ill., La., Tenn)

NAT'L GYPSUM CO
Medicine Lodge
MINE & PLANT, gypsum
Plant Mgr: D C Chade
Mine Supt: Brad Saboda
Prod: 1,000 tons
(See Ind., Iowa, N.Y., Tex., Va)

PATTERSON MNG CO
127 Missouri Ave., West
Plains
MINE, Howell County, open pit,
Pb

PLATEAU MNG CO
101 Hulmead Bldg.,
Evanville 5, Ind.
SALT MINE, Oregon County,
open pit, Pb

RIGGS & MORRISON
Culfield
MINE, Howell County, open pit,
Pb

**SEARCY & HENDERSON
MNG CO**
Box 281, Picher, Okla
BENDELARI MINE, NW of
Picher, undergr., Zn, Pb
WILBUR MINE, Near Trease,
undergr., Zn, Pb
Idle

STOKOFF MINE, Zn, Pb
Supt: D W Searcy

SILVER STREAK CO
Baxter Springs
Own: Mr Zuvekas
MINE & MILL, 1 mi S of
Baxter
Idle

THUNDERBIRD MNG CO
Box 466, Baxter Springs
Supt: Clyde Hopkins
MINE, 1 mi W of Baxter, Zn, Pb
(Released from Mason Mng Co)
Idle

WILBURN, C E
145 Willow St., Baxter Springs
SKELLY MINE, Zn, Pb

KENTUCKY

**ALUMINUM CO OF
AMERICA**
SHOUSE MINE, Joy,
Livingston County, CaF₂
Idle
(See Ark., Ill., Pa)

BOURBON MNG CO
Marion
GOERING MINE, CaF₂

KENTUCKY FLUORSPAR
Marion
Pres: R N Fraser
VP: Frank Stegeman
Sec-Treas: Sam Ogenheim
Purch Agt: E W Fraser
TWO 100-TON FLOT MILLS,
Marion & Rosiclare, Ill.
TWO 5-TON HEAVY-MED MILLS
Marion & Rosiclare, Ill.
Mill Supt: E W Fraser
Mill Frm: W Matthews
Assayer: C L Fraser

**MARIMEX FLUORSPAR
CO**
Marion
MINE, CaF₂
Idle

MICO MNG & MFG CO
Marion
MINE, baffle, open pit

**ROSLARE LEAD &
FLUORSPAR MNG CO**
Rosiclare, Ill.
PROMY MINE, Crittenden
County, undergr., CaF₂
Prod: 50-75 tons
(See Ill.)

LOUISIANA

CAREY SALT CO
Winfield
MINE, Winfield, undergr.,
salt
Mgr: W H Cameron
Supt: Al Tracy
Mech Eng: J M Thornton
Mine Frm: J E Austin
Prod: 600 tons
MILL, at mine
(See Kans.)

**DIAMOND CRYSTAL
SALT CO, JEFFERSON
ISLAND DIV**
St Riverdale, St Clair,
Mich.
MINE, undergr

FREEPORT SULPHUR CO
161 E 42nd St., New York 17,
N.Y.
LOUISIANA DIV, Commerce
Bldg., New Orleans, mines at
Grande Ecaille, Garden
Island Bay, Bay Ste Elaine,
Chacahosta
VP: E D Wingfield
LAKE PELTO, GRANDISIE
MINE
Under devel
(See N.Y.)

**INTERNAT'L SALT CO
INC**
Drawer 311, Scranton 3, Pa
AVERY ISLAND MINE, Avery
Island, undergr., rock salt
AVERY ISLAND REFINERY,
vacuum & grainer pan evap
(See N.Y., Pa., Mich.)

**JEFFERSON LAKE
SULPHUR CO**
1408 Whitney Bldg.,
New Orleans 12
Pres: Eugene H Walst, Jr.
VP, Frack Sulphur Plants:
Harvey A Wilson,
Charles J Ferry
Treas & VP: L L Lassalle
Purch Agt: Carl McElrath
STARKE DOME, Vinton
(See Tex.)

MORTON SALT CO
130 S La Salle St.,
Chicago 3, Ill.
MINE, Weoka, salt
Gen Mgr: L J Broussard, Jr.
Asst Gen Mgr: Wayne West
Prod: 1,300 tons
(See Ill., Kans., Ohio, Tex.)

NATIONAL LEAD CO
New Orleans
BARITE PLANT, dry grinding
Plant Supt: D M Middleton
(See Ark., Calif., Colo., Kans.,
Mont., Mo., Nev., N.Y., Tenn.,
Tex., Wyo)

MAINE

BELL MINERALS CO
West Paris
PERHAM MINE, Oxford County,
feldspar
Gen Mgr: H W Childs
GRINDING MILL, feldspar

**INTERNAT'L MIN &
CHEM CORP**
Old Orchard Rd, Shokie, Ill.
MINES, Sagadahoc County,
feldspar
50-TON MILL, Topsham
Gen Supt: J C Brannigan
(See Ariz., Colo., Fla., Ill., Miss.,
N Mex., N.C., S.D., Tenn., Va.,
Wyo)

PENOBSCOT MNG CORP
Barboursville, Brooksville
Pres: C H Stewart
VP: K D Thomson
Sect: D C Marshall
CAPE ROSIER MINE, undergr.,
Cu, Zn, Ag
Gen Mgr: K D Thomson
Under devel

**PORTLAND-MONSON
SLATE CO**
465 Congress St., Portland
Gen Mgr: Dan E Edgerton
MINES, Monson, Piscataquis
County, undergr.,
MILL, Monson, Elac Slate

**ROCKLAND-ROCKPORT
LIME CO INC**
P O Box 359, 437 Main St.,
Rockland
Pres-Purch Agt: A E Orff
Treas: C C Douglas
MINES, Knox County, open
pit, limestone,
Mine Supt: David B Hoch
Asst Mine Supt:
Donald K Bickford
Prod: 400 tons per day
MILL, Rockland
Mill Supt: David R Hoch
Asst Mill Supt: Karl T Hurd

TOPSHAM FELDSPAR CO
Topsham
Pres: E W Booker
Gen Supt: D R Drennon
TRENTON MINE, Sagadahoc
County, feldspar, Quartz
Under devel
50-TON GRAB MILL, Cathance
Rd, Topsham

MARYLAND

**AMERICAN SMELTING &
REFINING CO**
Highland & Eastbourne Aves.,
Baltimore 24
BALTIMORE PLANT
Mgr: A J Kieff, Jr.
(See Ariz., Calif., Colo., Idaho,
Ill., Mont., Neb., N.J., N Mex.,
N.Y., Tex., Utah, Wash., Federal
Mng & Smelt Co, Mo)

POWHATAN MNG CO
6721 Windsor Mill Rd.,
Baltimore 7
Pres-Gen Mgr: Fred A Mitt
VP-Sect: C Silver
Treas: Frances E Mett
Office Mgr: F E Mett
MICAVILLE MIN, Micaville,
Adelstein
Mine Supt: Frank Burleson
Prod: 15 tons per day
(See Calif. & Ga)

**UNITED CLAY MINES
CORP**
Fowler
MINE #2, open pit
Mine Supt: H Michael Breaux
Prod: 100 tons
50-TON FLOT MILL, at mine
(See Fla., Ga)

MASSACHUSETTS

COPPER RANGE CO
24 Federal St., Boston 10
Pres: J P Lally
VP: Nelson J Darling, Jr.
John V O'Connor, Robt H
Jacobson, C DeWitt Smith
Sect: J P Achroyd
Treas: D M Goodwin
Purch Agt: S H Bailey
(See Mich., White Pine Copper
Co, Mich. & Mass.)

U S GYPSUM CO
300 W Adams St., Chicago 6,
Illinois
MINE, Farnams, open pit,
limestone
Works Mgr: E E Long
(See Calif., Colo., Conn., Ill., Ind.,
Iowa, Okla, S.D., Tex., Utah, Va)

U S SMELTING, & MNG CO
75 Federal St (Box 2137)
Houston
Pres: F S Malach
(See Alaska, Ariz., N Mex.,
Utah)

WHITE PINE COPPER CO
Box 2137, 75 Federal St.,
Boston
Pres: M S Mulach

VP: W P Nicholls,
Geo McGrath
Sec: J R Ackroyd
Treas: D M Goodwin
Purch Agt: Russell Baird
(See Copper Range Co, Mich &
White Pine Copper, Mich)

MICHIGAN

CALUMET & HECLA, INC., CALUMET DIV

1 Calumet Ave, Calumet
VP & Gen Mgr: A S Kromer
Dir of Purch: W A Barn
Dir, Ind & Pub Rel: H D Stott
NO 3 AMHEEK, ALLOUEZ,
CENTENNIAL NO 3, AHMEER
NO 3, PENINSULA, SENECA,
Calumet, undergr, Cu
Dir, Mgr: C A Campbell
Ch Geol: J P Pollock
Proj & Spec Eng Mgr:
F H Ostlander
Mech Proj Eng: R P Spencer
Elec Proj Eng: A W Hill
Construction Proj Eng:
T W Knight
Prod. 6,600 tons
6,000-TON GRAY-FLINT MILL
Dir, Mgr: R K Poull
CALUMET & HECLA SMELTER
Hubbell, S reverb Cu furnaces
Dir, Smelting & Ref: K F Farley
Prod. 90,000 lbs Cu yrly
OSCEOLA NO 6 MINE & NO 13,
Calumet, undergr, Cu
Under devel
CENTENNIAL NO 3 MINE,
Calumet, undergr
Explor
CALEDONIA MINE, Greenland,
undergr, Cu
Idle
(See Ill, N Mex, N Y)

CERTAIN-TEED PRODUCTS CORP

120 E Lancaster Ave,
Ardmore, Pa
MINE, Grand Rapids, Gypsum,
undergr, open pit
(See Pa)

CLEVELAND-CLIFFS IRON CO, ORE MNG DEPT

1460 Union Commerce Bldg,
Cleveland 14, Ohio
Pres: Walter A Sterling
Asst to Pres: Grover J Holt
VP, Mining: J S Westwater
Sec: Robert M Kimmel
Treas: J P Long
MICHIGAN OPER, Ishpeming
Mgr, Minn Mines:
Hugh J Leach
Mgr, Ore Devel: S W Sundeen
Gen Supt: H C Swanson
OHIO-WEBSTER MINE, Baraga
County, surface, Fe
Supt: K C Olson
BUNKER-HILL-MAAS MINE,
Marquette County, undergr, Fe
Supt: T A Kauppila
CLIFFS SHAFT, Marquette
County, undergr, Fe
Supt: O Marjama
MATHER MINE, Marquette
County, undergr, Fe
Supt: "A" Shaft: Gil Dawe
Supt: "B" Shaft: A J Andelin
TILDEN MINE, Marquette
County, surface, Fe
Supt: K C Olson
HUMBOLDT MINE, Marquette
County, surface, Fe
Supt: K C Olson
REPUBLIC MINE, Marquette
County, surface, Fe
Supt: E W Lindroos
RESEARCH LAB, Marquette
County, Ishpeming
Ch Met: L J Erick
Proj Eng: D K Campbell
PELLETIZING PLANT,
Marquette County
Supt: H W Rembold
ORE IMPROVEMENT PLANT,
Marquette County
Supt: Robert DeGardis
MNG METHODS RESEARCH
DEPT
Supt: John M Haivala
(See Minn, Ohio)

COPPER RANGE CO
24 Federal St, Boston 10,
Mass
CHAMPION MINE, Fairbaldale,
undergr, Cu

Gen Mgr: Henry Connellock
Elec Eng: M Myers
FLOT MILL, Freda
Supt: John Harris
Elec Mass & White Pine
Copper Co

GRAND RAPIDS PLASTER CO

1204 Peoples National Bank
Bldg, Grand Rapids 3
MINE, Gypsum, undergr,
open pit

HANNA IRON ORE DIV, NAT'L STEEL CORP

Iron River
Gen Mgr: R W Whitney
Mgr, Minn Mines: W F Shimmers
Gen Supt: K F Kushlitz
Ch Geol: A E Walker
Mech Eng: Warren W Jamar
Elec Eng: Carl W Anderson
Purch Agt: G E Tromblay
CANNON MINE, Stambaugh,
undergr, Fe
Mine Supt: O A Koehler
Mine Capt: H Krans
Prod: 2500 tons
HAWTHA MINE, Stambaugh,
undergr, Fe
Mine Supt: J B Quayle
Mine Capt: H Thornberg
Prod: 1800 tons
HOMER MINE, Iron River,
undergr, Fe
Mine Supt: J D McAlliff
Mine Capt: G Johnson
Prod: 1800 tons
(See Minn, Ohio, Osark Ore, Mo)

HANNA MNG CO, THE

Iron River
Gen Mgr: R W Whitney
Mgr, Minn Mines: W F Shimmers
Gen Supt, undergr mines:
K F Kushlitz
Gen Supt, open pit mines:
E W Gwist
Ch Geol: A E Walker
Mech Eng: Warren W Jamar
Elec Eng: Carl W Anderson
Purch Agt: G E Tromblay
WAUSECA MINE, undergr, Fe
Mine Supt: J D McAlliff
Mine Capt: W A Lundwall
Prod: 2100 tons
GROVELAND MINE, Randville,
open pit, Fe
Mine Supt: H Lee
Gen Foreman: B Seftio
4,000-TON MILL, Randville
(See Minn, Ohio, Osark Ore
Co, Mo)

INLAND STEEL CO, IRON ORE OPER

424 S Pine St, Ishpeming
Pres: Joseph L Block
Sen VP: P D Block, Jr
Supt: Graydon Megan
Treas: W N Love
MORRIS & GREENWOOD MINES,
Ishpeming
SHERWOOD MINE, Iron River
BRISTOL MINE, Crystal Falls,
undergr, Fe
Gen Mgr, Ore Mines:
R D Satterley
Mgr, Ore Mines: H M Graft
Pres: A T Broderick
Mech Eng: J R Gronseth
Ch Eng: P F Ribotto
(See Ill, Minn)

INTERNAT'L SALT CO, INC

Box 311, Scranton 2, Pa
DETROIT MINE, 12841 Sanders
St, Detroit 17
undergr, rock salt
(See La, N Y, Pa)

JONES & LAUGHLIN STEEL CORP, MICHIGAN ORE DIV

Tracy MINE, undergr, Fe
Mgr: R W Brand
Supt: R L Balcom
Mech Eng: Michael Kerzman
Elec Eng: John B Motto
Mine Frm: R L Prideaux
Mine Eng: Wm A Benson
(See Minn, N Y, Pa)

THE METRO-NITE CO

3523 W Silver Spring Drive,
Milwaukee 9, Wisc
MINE, Felch, Dolomite,
undergr, open pit

NORTH RANGE MNG CO

Negaunee
Pres: F F Book
Ch of Bd: R S Archibald
VP: B Archibald
VP, Oper: F J Haller
Sec: E S Holmgren
Treas: Herbert V Book
Ch Elec: G H Peterson
Gen Supt: J C Kirkpatrick
Purch Agt: J M Archibald
BOOK MINE, Alpha
Supt: J A Nicolson
Mill Supt: J E Hayden
Capt: James Pelton
CHAMPION MINE, Champion
Supt: R L Sundeen
Capt: Charles Coole
LEONIDAS MINE, Eveleth, Minn
Supt: Hugh Clark
Capt: Leonard Erickson
PENOKIE, Ironwood
Supt: J Zuraw
Capt: Wm Bianchi

PICKANDS MATHER & COMPANY, (Managing Agts)

709 Seward Bldg, Duluth 3
Minn

THE MAUTHE MNG CO, GENEVA & NEWPORT MINES,

Ironwood, undergr
Supt: A L Johnson
Asst Supt: A J Cigallo
John H Sharrer
PURITAN MNG CO, PETERSON
MINE, Bessemer, undergr
Supt: J C Waugard
Asst Supt: L G Woodworth
SUNDAY LAKE IRON CO
SUNDAY LAKE MINE, Wakefield
undergr
Supt: R D Hodge
MEMORIAL RANGE, Caspian
Supt: C D Bailey
Dist Mng Eng: Guerdon Anderson
Ch Clerk: S K Bres
MARQUETTE RANGE (Same
supervisory personnel as above)
(See Minn, Wisc)

THE QUINCY MNG CO

Hannock
FLOT MILL, Torch Lake
reclamation plant, Cu

REPUBLIC STEEL CORP

Genl Off: Republic Bldg
Cleveland, Ohio
Dist Off: 204 Seward Bldg,
Duluth 3, Minn
Dist Mgr: B C Howell
Ch Mech & Elec Eng: I V Crego
TORIN-COLUMBIA-
MONONGAHELA MINE, Crystal
Falls, undergr, Fe
Mine Supt: E H Anderson
Mine Frm: Emil Johnson
Assay: J Trevarchian
Prod: 250,000 tons per year
(See Ala, Minn, N Y, Ohio)

WHITE PINE COPPER CO

24 Federal St, Boston 10,
Mass

WHITE PINE MINE, White Pine, undergr, Cu

VP & Gen Mgr:
William P Nicholls
VP & Asst Gen Mgr:
Geo R McGrath
Geol: Dr E L Ohle
Met: Virgil L Lessius
Mech Eng: O F Hubertan
Elec Eng: John A Rolter
Mine Supt: L A Garfield
15,000-TON FLOT MILL,
White Pine
Mill Supt: Ivan T Bowman
Asst Mill Supt: Ross E Gamble
REVERB SMELTER, White Pine
Supt: Geo D Weaver
(See Copper Range Co & White
Pine Copper Co, Mass)

MINNESOTA

BUTLER BROS (MA Hanna Co, Agents)

Ishpeming
Mgr of Minn Mines:
B M Andreas
MINES, Mesabi Range, Minn,
Fe, Mn
HARRISON, HALOBE, NORTH
HARRISON, QUINN GROUP
MINE, Nashua, Washauk
Twp, Cooley
PATRICK AWM, PATRICK
ANNEX, KEVIN, DAVID,

SHYDER GROUP MINE, Cooley,
Greenway Twp
WYMAN MINE, Washauk Twp,
AROMAC, OLSON MINES,
HARRISON TAILINGS FOND
"A" MINE
(See Ohio)

CHATACO MNG CO (See Pacific Isle Mng Co)

CLEVELAND-CLIFFS IRON CO, ORE MNG DEPT

1460 Union Commerce Bldg,
Cleveland 14, Ohio
Chrm-Pres: Walter A Sterling
Asst to Pres: Grover J Holt
VP, Mng: James S Westwater
Sec: Robert M Kimmel
Treas: J P Long
MINNESOTA OPER, 50th E Ind
Ave, Hibbing
Mgr: Minn Mines: J J Foucault
Gen Supt: W A Pakkala
HAWKINS MINES, Nashua,
surface

WASH PLANT, H M S PLANT

Supt: William LeClair
HILL-TRUMBLE MINE, Marble,
open pit

WASH & H M S PLANT, Calumet Supt: A E Hill

BOLMAN-CLIFFE MINE, Coleraine, open pit

Supt: A E Hill

WASH & H M S PLANTS, Coleraine

Supt: A E Hill

WANLESS MINE, Buhl, open pit

Supt: Mel Viant

1916-1918 CANISTO MINE, Coleraine, open pit, wash, H M S Plant

Supt: Ronald Pearson (See Mich, Ohio)

CONSUMERS ORE CO

Hibbing (M A Hanna Co,
Agents)
Mgr of Minn Mines:

B M Andreas

MINES, Mesabi Range, Fe (See Ohio)

COONS PACIFIC CO

Box 27, Eveleth
Pres: H H Harrison
Supt: R B Hurd
CUSTOM IRON ORE CONCN
8,000 TON GRAY-HEAVY
MEDIA MILL, Eveleth
(See Pacific Isle Mng Co)

DOUGLAS MINING CO

Hibbing (M A Hanna Co,
Agents)

Mgr of Minn Mines:

B M Andreas

Asst Gen Mgr: R C Wallace

Ch Eng: R O Buck

MINES, Mesabi Range, Fe

DOUGLAS, DUNCAN GROUP

MINE, Balkan Twp (See Ohio)

ERIE MNG CO (Managed by PICKANDS MATHER & CO)

Hoyt Lakes
(Owned by Youngstown Sheet &
Tube Co, Interlake Iron Co,
Steel Company of Canada Ltd;
Bethlehem Steel Co)

CRUSHING, CONCENTRATING & PELLETIZING PLANT, open pit, Taconite

Wrks Mgr: L E Johnson

Asst Wrks Mgr: B F Borgel

Asst Wrks Mgr, Service:

J H Healy

Supt, Process Plants: K F Kohn

Supt, Mng: H F Sears

Asst Supt, Mng: R W Bell

Supt, Maintenance: B D Mull (See Pickands Mather & Co, Mich, Minn, Wisc)

HANNA IRON ORE DIV, NAT'L STEEL CORP

Box 726, Hibbing
MINES, Cuyuna Range, Fe, Mn
PORTSMOUTH GROUP,

ROBERT MINE, Crookby
MINES, Mesabi Range, Fe
BUNKER MINE, Coleraine
(See Mich, Ohio)

THE HANNA MNG CO (Formerly Hanna Coal & Ore Corp)

2155 2nd Ave E, Hibbing
Mgr, Minn Mines:

B M Andreas

Asst Mgr, Minn Mines:

R C Wallace

Gen Supt, Maabi Range:

R B Crist

Gen Supt, Cuyuna Range, Crookby

G B Sumner

Supt, Cooley Grp, Nashua:

F E Dyson

Supt, Miss Grp, Keewatin:

R M Gross

Supt, Buckeye Grp, Coleraine:

A G Nelson

Supt, Pierce Grp, Wegman

Mine, Hibbing: L M Bredvold

Supt, S Agnew Grp, Hibbing:

R E Thompson

Supt, Douglas Grp, Chisholm:

L T Kroat

Supt, Enterprise Mine, Virginia: E C Johnson

Supt, Fillmore Co Mines, Spring Valley: C A Pedersen

Chief Eng, Hibbing: R O Buck

Asst Chf Eng, Hibbing: C J Melt

Asst Chf Eng, Nashua:

H A Larson

Asst Chf Eng, Crookby:

ER Jackson

Chas Mgr, Hibbing:

O A Borgeson

Consulting Dir of Beneficiation, Nashua: A E Matson

Dir of Beneficiation, Nashua:

S E Erickson

MINES, Mesabi Range, Fe, ANGORNE LEACH, CARLE 22, EAST ALPENA, HUNT, PERRY

MINES, Cuyuna Range, ALSTEAD, S ALSTEAD, ARKO, N HILLCREST & EXTENSION, S HILLCREST, HUNTINGTON, PEIGH, MAROCCO, MUSSEY

MINES, Fillmore & Mower County, Q BAKER, H BLY, M BONNERUD, Q BORNFELETH, O BREMER, W A L BYRGE, M COOPER, R COPEMAN, N FENSTERMACHER, W FARMAN, H GRANTUM, K HARNER, R V HASLAM, J H HEBBO, Q KAPPERS, A KUMM, W LEE, H M LONG, C MANDELLO, W MENESKE, Q MEYER, O MEYER, K OLSON, T OLSON, OSTERUD & DUNCANSON, D PEARCE, J PRINSEN, P RUSENIK, Q SCHMIDT, G TART, H & C THORSON, D O THORSON, R WINTER (See Mich, Ohio & Osark Ore Co, Mo)

HANNA ORE MINING CO (M A Hanna Agents)

Hibbing

Mgr of Minn Mines:

B M Andreas

MINES, Mesabi Range, Fe

BRAY, GORDON, MESABI CHIEF, MISS 23, Nashua Twp, Keewatin, BRUNT MINE, IMPRO RESERVE, NORPAC MINE, NORTH UNO MINE, ROY MINE, WEST ALPENA ENTERPRISE MINE, Virginia PIERCE GROUP, Hibbing (See Ohio)

HOLLAND MNG CO (See Pacific Isle Mng Co)

INLAND STEEL CO, IRON ORE OPER

Iron
ARMOUR NO 1 MINE, Ironton,
undergr, Fe
Supt: L S Olson
Prod: 1150 tons per day
ARMOUR NO 2 MINE, Ironton,
undergr, Fe
Supt: L S Olson
Under devel
(See Ill, Mich)

JESSIE H MNG CO

Box 486, Grand Rapids
Pres: E W Hallen
VP: R H McGiffert
JESSIE MINE, 3 mi E of Grand
Rapids, open pit, Fe
Mine Supt: L R Bewall
Minn Frm: Art Anderson

Mine Engr: J J Walker
Prod: 1,400 tons
2,000-TON MILL, 3 mi E of
Grand Rapids

**JONES & LAUGHLIN
STEEL CORP., MINN ORE
DIV**

Virginia
Mgr: H F Nellberg
Asst Mgr: R E Dorochoer
Western Dist Supt: J F Lindon
Eastern Dist Supt: F W Kruse
Supt of Maint: D Madich
Ch Asst: T A Parish
Res Eng: W F Gaspar
Res Geol: T E Stephenson
Ch Mng Engr: C H Grant
Ch Ore Dressing Eng:

R W Livingston
Super, Pore Belt
C E Dickens

Mine Ind Engr: L E Hodill
MINES, Mesabi Range, surface,
Fe

**HILL ANNEK MINE, MILL &
TAILINGS RECLAMATION
PLANT, Calumet**

Mine Supt: W Ball
Mill Frmr: R L Abercrombie
Plant Frmr: G D Sarff

**LONGYEAR MILL & MINE,
Hibbing**

Dist Supt: J F Lindon
Mine Supt: J Strande
LIND-GREENWAY MINE,

Coleman
Dist Supt: J F Lindon
Mine Supt: A C Seaborg

Under devel
**COLUMBIA MINE & MILL,
Virginia**

Dist Supt: F W Kruse
**SCHLEY-PETTIT MINE & MILL,
Gilbert**

Dist Supt: F W Kruse
(See Mich, N.Y., Pa)

**LITHIUM CORP OF
AMERICA INC**

Rand Tower Bldg,
Minneapolis, Minn

Pres: Herbert W Rogers
VP: Fremont P Clarke
Sec: Salisbury Adams

Treas: W W Osborne
Purch Agt: John W Douglas
Asst: Fred Dixon

(See N.C., S.D.)
**MICHIGAN CHEMICAL
CORP**

Saint Louis
Pres: Theodore Marvin
VP: Fred A DeMaestri

Sec-Treas: R J Knapp
Purch Agt: W A Gibbs
Mng Engr: Jordon H Whitman

**DOLORES MINE, Box 481,
Golden, near Central City,
Tritium**

Gen Mgr: J H Whitman
(all mining contracted)

**SILVER SPRUCE 56 TON FLOT
MILL, Mabe Springs**

Mill Supt: M W Tintons
Asst Mill Supt: Raymond O
Buffum

Assayer: Stanley Hill
W S MOORE CO

400 Torrey Bldg, Duluth
Pres: W E Moore

Sec: H A Nelson
Geol: J V Everett
RANGE OFFICE, 485 W Grant

St, Hibbing
Gen Mgr: H E Reese
Ch Engr: J M Madsen

Gen Supt: John Johnson
Mech Supt: N P Arnold
Gen Plant Frmr: W Klumstein

Office Mgr: J R Kennedy
**JUDSON MINE, 1 mi S of Buhl,
surface, Fe**

**JERSON CRUSHING &
SCREENING PLANT**

MARISKA MINE, 1 mi NE of
Gilbert, surface, Fe

**HEAVY MEDIA
CONCENTRATOR ALICE,
NORMAN, STUBLER &
YAWKEY MINES, surface, Fe**

**MORTON ORE CO (M A
Hanna Co, Agents)**

Hibbing
Mgr of Minn Mines:
B M Andrews

MINES, Mesabi Range, Fe
MORTON, SOUTH EDDY GROUP
MINE, Shum-Twp, CAMPBELL
"D" MINE

Mine Frmr-Mine Supt:
R E Thompson

OGLEBAY HORTON & CO
1300 The Hanna Bldg,
P O Box 6608, Cleveland,
Ohio

**NORTHERN OFFICE, 308
Christie Bldg, Duluth 2**

Ind Mat Dir: H J Genoum
Mng Engr: A F Toranzo

ST JAMES MINING CO, Aurora
Mgr: Oglebay Norton & Co

**ST JAMES MINE, Aurora,
surface, Fe**

Supt: B L Knudson
Asst Supt: T E Tridley

Master Mech: Walter Williams
Ch Elec: Edward M Plattner
(See Ohio)

ORECLONE CONC CORP
40 West 5th St, N.Y. 19 or
Hoover Rd, Virginia Minn

Pres: Norman Rodman
Mng Supt: Arthur Arbman
Concentrating Process

PACIFIC ISLE MNG CO
3521 First Ave, Hibbing
Pres: Hugh H Harrison

VP & Gen Mgr:
John D Bontje, Jr

Treas: D J Keeler
Sec: E T Dinger

Gen Supt: Arne O Tuomala
Asst Gen Mgr: H M Hart, Jr

Asst to Gen Mgr, Met:
Donald C Kimball

Asst to Gen Mgr, Eng:
E T Eldem

Mineral Devel Dept:
G T Beardshear

Ch Engr: A T Vellella
Mgr, Zontelli Div, Pittsburgh

Pacific Co: Nelo Hill
INCLUDES CHATACO MINING

COMPANY, COONS PACIFIC
COMPANY, HOLLAND MINING

COMPANY, PITTSBURGH
PACIFIC COMPANY

MINES: CHATACO, CROXTON-
SYME, FOWLER-MEADOW,
GRAHAM-WENTWORTH,

IRQUOIS, JULIA-COMMODORE
PLANTS; NORTH UMN CONCEN
Plant Superv: Jack Durham

COONS PACIFIC CONCEN
Plant Superv: Ralph Hurd

VIRGINIA CONCEN
Plant Superv: Earl Saari

JULIA WASHING PLANT
MANUEL WASHING PLANT

ST PAUL WASHING PLANT
(See Mich & Pittsburgh Pacific
Co, Zontelli Div, Minn)

**PHILBIN MNG CO (M A
Hanna Co, Agents)**

1300 Leader Bldg, Cleveland,
Ohio

**WEGGUM MINE, Box 720,
Hibbing, surface, Fe**

Mgr of Minn Mines:
B M Andrews

Asst Mgr of Minn Mines:
C H Wallace

Gen Supt: R B Crist
Mech Engr: P B Vidmar

Elec Engr: P B Bohon
Purch Agt: G H Sheld

Mine Supt: L M Bredvold
WASH PLANT

PICKARDS MATHER & CO
700 Sellwood Bldg, Duluth 2

Gen Mgr: E L Joppa
Mgr of Eng: O L Yeuch

Assoc Gen Mgr: D M Chisholm
Ch Mech Engr: B W Bernstrom

Purch Agt: D A Brunau
Supvr of Safety & Ind Rel:

E A Arnoldson
Asst Gen Mgr, Open pit oper:
T C Thielman

Adm Asst, open pit oper:
Bruce Stunkard

Asst Gen Mgr, undergr oper:
F R Werther

Adm Asst, Undergr oper:
W E Seppanen

**LAKE MNG CO, EMBARRASS
MINE**

Supt: W L Thomsie

**CHETE MNG CO, ALBANY
MINE & WASHING PLANT,
Hibbing, undergr**

**HOYT MNG CO, SCRANTON
MINE, CRUSHING & WASHING
PLANT, Hibbing, surface**

Supt: T R Trogenbo

**MAHONING ORE & STEEL CO,
MAHONING MINE, Crushing,
Beneficiating, Hibbing, surface**

Supt: W D Webb

**UTICA MNG CO, CARMi
CARSON LAKE MINE &**

**CRUSHING PLANT, Hibbing,
surface**

Supt: E R Tyler
**BENNETT MNG CO, BENNETT
MINE**

Supt: E R Tyler
Oper Asst: Cecil Scott

**BALKAN MNG CO, DANUBE
MINE & BENEFICIATION PLANT,
Bovey, surface**

Supt: L M Becker
Asst Supt: A M Anderson

**WESTERN MNG CO, WEST HILL
MINE & BENEFICIATION PLANT,
Grand Rapids, surface**

Supt: B T Bell
Asst Supt: J E Schelske

**WESTERN MNG CO, TIOGA
MINE**

Supt: R T Bell
CUYUNA ORE CO, MAHONING

MINE & CRUSHING PLANT,
Croby, surface

Supt: H Stetson
SAGAMORE ORE MNG CO,
SAGAMORE MINE, CRUSHING &
DRYING PLANT, Riverton,

surface
Supt: H Stetson

(See Mich, Wisc)
PIONEER MNG CO

Box W, Biwabik
Pres: Frank S Bergstrom

Ch of Bd: Patrick Butler
Sec: F J McArthur

Treas: R F Floeder
MARY ELLEN MINE, 1/2 mi W
of Biwabik, surface, Fe

Mine Frmr: Frank Pross Jr
6000-TON-HEAV-MED MILL,
at mine

PITTSBURGH PACIFIC CO
(See Pacific Isle Mng Co)

**PITTSBURGH PACIFIC CO
ZONTELLI DIV**

Ironton
Pres: Emil Zontelli

VP: Henry Zontelli
Sec-Treas: Anne V Stang

Gen Mgr: N E Hill
Gen Supt: Henry Zontelli

Met: John Simons
Geol: Elton LaSart

Mech Engr: Francis Chase
Elec Engr: Dan Doshan

Purch Agt: Ernest Kutzner
VIRGINIA MINE, N of Ironton,
Cuyuna Range, surface, Fe

4,000-TON VIRGINIA PLANT
TROMMOLD

**MINNESOTA MINES
GRAMAN NO 1 MINE, Mesabi
Twp, Mesabi Range,**

surface, Fe
MANGAN-JOAN MINE,
Ironton, Cuyuna Range, surface,

Fe
MERHITT LEAH ORE
STOCKPILE, Trommald, Cuyuna

Range
MANUEL MINE, Crosby, Cuyuna

Range, surface, Fe
2,000-TON MANUEL PLANT,
Crosby

(See Pacific Isle Mng Co,
Minn)

REPUBLIC STEEL CORP
Gen Off: Republic Bldg,
Cleveland, Ohio

Dist Off: 204 Sellwood Bldg,
Duluth

Dist Mgr: F H Cash
Ch Mng Engr: S C Howell

Ch Mech & Elec Engr: IV Crego
SUSQUEHANNA MINE, Hibbing,
open pit

Supt: S V Smith, Jr
(See Ala, Mich, N.Y., Ohio)

RESERVE MNG CO
Silver Bay

Exec VP: R J Limney
VP-Treas: J W Bryant

Sec: J J Dwyer
Mgr, Silver Bay Div:

E C Lampman
Purch Agt: E K Smith
Dir of Ind Rel: W L Edwards

Dir of Public Rel:
Edward Schmid

Supt, Pelletizing: K M Haley

Supt, Crushing & Concntr:

E M Furness

Mgr, Babbitt Div: M G Woodie

PETER MITCHELL MINE,
Babbitt, open pit, from pellets
from taconite rock

Mine Supt: F E McIntire
E W DAVIS WORKS, Silver Bay,
Magnetic separation

(See Ohio)

RUDE & FREYBERGER
Box 779, Hibbing

Part: J O Rude
TROY MINE, Eveleth, Mesabi

Range, open pit, Fe, H M S &
JIG PLANT

**BOEING MINE, Hibbing, Mesabi
Range, open pit, Fe, Wash Pl**

PENNINGTON MINE, Ironton,
Cuyuna Range, undergr, Fe

CARLSON-NELSON MINE,
Cuyuna Range, open pit, Fe

HMS & JIG PLANT

ST JAMES MNG CO
ST JAMES MINE, Aurora, open
pit, Fe

Gen Supt: B L Knudson
Asst Supt: T E Tridley

Master Mech: W Williams
Ch Elec: Edw Plattner

(See Oglebay Norton Co)

SKURIBROS CO
700 6th Ave N, Virginia

Pres & Treas: Frank Skubic
VP & Purch Agt: Edward Skubic

VIRGINIA MINE, Eveleth, 1 mi
S, surface, Fe

Gen Supt: Edward Skubic
Mng Mgr: Frank Skubic

Elec Engr: Karl Sulentic
Master Mech: C Larry Dahl

13,000-TON-HEAV-MED, at
mine, Jig, Spirals-Magnetic Sep

Mill Supt: Karl Sulentic
Asst Mill Supt: Joseph Spolar

SNYDER MNG CO
1101 Alworth Bldg, Duluth 2

Pres: Wm F Snyder, Jr
VP & Gen Mgr: Fayette Brown Jr

Gen Supt: C O Rudstrom
Ch Engr: Rudolph A Ekas

Ch Chem: A W Johnson
Mech Supt: A A Erickson

Controller: Y O Youngdahl
Purch Agt: C J Hathaway

Supvr, Mobile Ept: O E Larsen
Gen Maint Frmr: J Zobits

WEHR MINE, Hibbing, open pit,
Fe

Mine Supt: J J Maney
Gen Mine Frmr: J J Munter

Res Eng: E Zobits
2000-TON GRAV MILL

Mill Frmr-Master Mech:
D C Costanzi

**WHITESIDE MINE, Buhl, open
pit, Fe**

Mine Supt: T J Barker
Gen Mine Frmr: A Stukel

Res Eng: M J Bobich
Master Mech: F C Hodge

26,000-TON-GRV-MILL, at
Whiteside mine

**GODFREY MINE, Chisholm,
undergr, Fe**

Mine Supt: H F Haller
Mine Capt: O A Arvelson

Mine Engr: K F Coen
Master Mech: J V Vidmar

(See Pa)

**SOUTH AGNEW MNG CO,
(M A Hanna Co, agents)**

Hibbing
Mgr of Minn Mines:
B M Andrews

MINES, Mesabi Range, Fe

**SOUTH AGNEW, AGNEW NO 2
GROUP MINE, Staats Twp**

Mine Supt: R E Thompson

(See Ohio)

**U S STEEL CORP,
OLIVER IRON MNG DIV**

Wolvin Bldg, Duluth 2

Pres: R T Elstad

VP-Oper: W N Matheson

Asst to VP-Oper: L B Campbell,

W E Catter, Jr

VP-Admin: R O Hawkinson

Gen Atty: F B Stevens

Asst Sec: H P Clarke,

T O Archer

Treas: R B Davenport

Comptroller: R D Ryan

Asst Comptroller: G T Bethune

Dir Mineral Dev: N A Moberg

Staff Asst to Dir Mineral Dev:

S V Bredley

Mgr Min Engr & Assessor

Mgr Geol Investigations:

R W Marsden

Mgr Beneficiation: A T Koenen

Asst to Mgr Beneficiation:
K F MacAlpine

Mgr Research: R J Martin

Asst Mgr Research: R L Bennett

Mgr Ind Engr: Q T Martin

Ch Engr: C N Bailey

Asst Ch Engr: C R Burton

Dir Ind Rel: J S Boote

Supr Ore Movement: F J Perry

Mgr Safety & Compensation:

R F Wilson

Mgr Personnel: D F Dodge

Ch Grader: O H Sharbach

Asst Ch Grader: M H Hall,

R L Hawkins

Purch Agt: L L Slabodkin

Asst Ch Mng Engr: O H Hill

Ch Chem: M O Carlson

Asst Ch Chem: L E Aha

ACTUEL MINE &
CONCENTRATOR, Mesabi

Range, surface, Fe

Supt: H F Bolton

**PLUMMER MINE &
CONCENTRATOR, Mesabi
Range, surface, Fe**

Supt: J H Harrison

Supt: L Scipioni (King Mine)

V V Ahola (Concentrator)

EASTERN DISTRICT, VIRGINIA

Gen Supt: John Chisholm

Asst Gen Supt: J M

MISSISSIPPI

AMERICAN COLLOID CO
3100 Sheffield Court,
Shokrie, Ill.
ABERDEEN MINE, surface,
barite, Aberdeen
Supt: Edward G. Birkholz
ABERDEEN MILL
Cap: 250 tons
WHITE SPRINGS MINE, surface,
barite, White Springs (P.O.
at Aberdeen)
Supt: Edward G. Birkholz
(See Ill, S.D., Wyo)

**INTERNATIONAL MINERALS
& CHEMICAL CORP**
Smithfield (P.O. Amory)
Mgr: C.M. Clay
Supt: J. Flowers
SOUTHERN BENTONITE MINE,
open pit
(See Ariz, Colo, Fla, Ill, Maine,
N Mex, N.C., S.D., Tenn, Va, Wyo)

KILMICHAEL ORE CORP
Box 37, Kilmichael
VP: C.S. Froeburne
MINE, open pit, Fe

MISSOURI

**AMERICAN ZINC, LEAD
& SMELTING CO**
1915 Paul Brown Bldg.,
St. Louis
Pres: H.I. Young
VP: Thornton Emmons, Alvin
C. Elide, Richard A. Young,
Howard L. Young
VP & Treas: W.J. Matthews, Jr.
VP & Contr: C.V. Burns
VP, Chg Traffic: W.S. Worrell
Sec & Ch Counsel: R.C. Perkins
Asst Sec & Asst Treas:
R.K. Wall, L.S. Jones
(See Ariz, Ill, Ohio, Tenn, Tex,
Wash, Wisc)

C & W POLITE MNG CO
Exdnt
MINE, Washington County, open
pit, barite

CARROLL, E.E. & H
Box 497, West Plains
MINE, Howell County, open pit,
Fe

DEBOTO MINING CO
225 S. Main St., DeBoto
MINES, surface, barite

**FEDERAL MNG &
SMELTING CO**
(Wholly-owned subd of Amer
Smelting & Refining Co)
DUTENWEG MINE, Jasper, Pa.
En
Ill

FOUR MNG CO
Caulfield
MINE, Howell County, open
pit, Fe

G. B. L. COMPANY
1808 Fed Reserve Bank Bldg.,
Kansas City 6
Pres: P. Vernon Griffith Jr
VP-Purch Agt: A.P. Lancy
Sec-Treas: John P. Lake
(See Colo)

KOSHKONONG MNG CO
Koshkonong
MINE, Howell County, Fe

LANE & ESSEX
Caulfield
MINE, Howell County, open pit,
Fe

**MAGNET COVE BARIUM
CORP**
Pototai
MINE, Pototai, open pit, barium
Plant Mgr: George L. Carter
Asst Plant Mgr: Floyd H. Carter

WASHING PLANT, at mine
Supt: B.J. DeCoe
250-TON MILL, at mine
Supt: Russell DeGonia
(See Fla, Nev, Tex, Wyo)

MERAMAC MNG CO
Pea Ridge
Res Mgr: Karl Dillheimer
MINE, near Pototai, Fe
Under devel

**MILWHITE MUD SALES
CO**
407 N 8th St., St. Louis 1
HOWELL, PALMER MINER,
Belgrade, Washington County,
barite
STAR MINE, OLD MINES,
Washington County, barite
SUN MINE, WHALEY SCOTT
MINE, Washington County,
barite

MINE LA MOTTE CORP
260 Park Ave., N.Y. 17, NY
Pres: Andrew Fletcher
VP: C.M. Chapin, Jr.,
Jos. A. Martins
VP & Treas: George I. Bridgen
Sec: Donald K. Louie
MINE LA MOTTE, undergr,
surface, Pb, Boone Terre
Div Mgr: E.A. Jones
Div Supt: P.F. Redfield
2,000-TON PLOT-GRAV MILL,
Fredericktown

MINERVA OIL CO
FLUORSPAR DIV
328 N 4th St., St. Louis
Pres: Jos. DeLooge
VP: Jos. DeLooge, Jr.
Sec: Bertley Jones
Gen Mgr: G.H. Montgomery
(See Ill)

MONSANTO CHEM CO
Lindbergh & Olive St. Rd.,
St. Louis 4
Pres: Charles Allen Thomas
Dir of Mng: G. Donald Emigh
INORGANIC DIV
Gen Mgr: J.L. Christian
Div Eng: W.T. Darroft
MINES & PLANT, Monbanto,
Tenn, elemental phosphorus
Plant Mgr: Edward J. Beck
(See Idaho, Tenn)

MURRELL & ROGERS
West Plains
MINE, Howell County, open pit,
Fe
Ill

**NATIONAL LEAD CO, ST
LOUIS DIVISION**
FOUNTAIN FARM, Pototai,
surface, barite
WET GRIND MILL
Supt: E.L.H. Sackett
(See Ark, Calif, Colo, Kans,
La, Mont, Nev, N.Y., Tenn, Tex,
Wyo)

**NATIONAL LEAD CO, ST
LOUIS SMELTING &
REFINING DIV**
Box 351, Fredericktown
Gen Mgr: G.O. Wiedermeyer
Mgr: Harold A. Krueger
MADISON MINES,
Fredericktown, undergr, Pb,
Cu, Ni, Co
Gen Supt: J.E. Phibus
Mine Supt: F.H. Hurst
Geol: R.P. Uhley
Met: L.W. Trainor
Elec Eng: R.W. Slavena
1,450-TON PLOT MILL
Mill Supt: G.F. Coops
Asst Mill Supt: Omega Moreland
REFINERY, Fredericktown
Mgr: W.R. McCormick
Supt: G.E. Peters
Under devel
(See Ark, Calif, Colo, La, Mont,
Nev, N.Y., Tenn, Tex, Wyo)

ORESCO INC
Alton
Mgr: Lewis R. Bach
MINE, Oregon County, open pit,
Fe

OZARK MNG CORP
Birch Tree
Pres: H.W. Powell
VP: A.L. Powell
Sec-Treas: D.W. Powell
POWELL MINE, open pit, Fe
Ill

OZARK ORE CO
Iron Mountain
HIGH MOUNTAIN MINE,
undergr, iron ore
Gen Supt: R.P. Malson
Geol: John Murphy
Mine Frm: Byron Miller

Mine Eng: R. Philby, Ken Weber
Master Mech: Henry Gratton
Chief Elec: Vic Callisto
3,000-TON PLOT-GRAV MILL
Mill Supt: Lloyd Erpenbach
Mill Frm: Leo Williams,
Luther Williams
Assay: R.B. Kay
(See M & Hanna Co & Ozark Ore,
Ohio)

PATILLO MNG CO
Caulfield
MINE, Howell County, Fe

POTTER SIMS MINES INC
Box 228, Joplin
Pres: Geo W. Foster
VP-Sec-Treas: D.S. Sims
Gen Supt: Leonard Parker
Mine Frm: Geo T. Brown
SUCKER FLAT MINE, Webb
City
WESTSIDE MINE, 1/2 mi S of
Alba, open pit, Pb, Zn
Prod: 1800 tons per day
3500-TON PLOT-GRAV MILL,
Webb City

ST JOSEPH LEAD CO
350 Park Ave., N.Y. 17, NY
Pres: Andrew Fletcher
VP: C.M. Chapin Jr., Francis
Cameron, Rene J. Mechin,
F.E. Wormsley
VP & Sales Mgr: Charles R. Ince
VP & Treas: George I. Bridgen
SOUTHEAST MISSOURI MNG
& MFG DIV, Box 32, Boone
Terre, undergr, Pb, Zn
Div Mgr: Elmer A. Jones
Asst Div Mgr: L.W. Castee
Ch Geol: John S. Brown
Gen Mech Supt: B.L. Beal
Div Supt: Indian Cr Mine &
Mill: K.R. Baker
Gen Mill Supt: T.J. Clifford
Gen Mine Supt: L.J. Turkey
Asst Gen Mine Supt: C.B. Davis,
B.T. Wykeff
Prod: 23000 tons per day
4-FLOT-GRAY MILLS
Mill Supt: H.A. Hoffman,
H.R. Stahl, K.B. Hall
Asst Mill Supt: E.J. Krokoskia
Cap: 23,000 tons
BLAST FURNACE,
Herculaneum
Div Mgr: John W. Sherman
Cap: 100,000 tons lead yrl
VIRBURNUM MINE, Crawford,
Iron & Washington County, Pb
Under devel
(See N.Y., Pa.)

**SHOOK & FLETCHER
SUPPLY CO**
West Plains
KINGSBURY MINE, Howell
County, MELTON MINE,
Shannon County, open pit, Fe
Gen Mgr: E.H. Craddock
Mine Supt: Robert Wilson
(See Ala)

STEPHENS MNG CO
2nd & Jefferson St.,
West Plains
Own: Carroll J. Stephens
MINE, 6 mi W of West Plains,
open pit, Fe
Prod: 50 tons
75-TON-LOG WASHER, at
mine
TERRACE MNG CO
Box 138, Pototai
Pres & Treas: F.W. Floyd
VP: G.D. Groves
Sec: Robert D. Evans
MINES, open pit, barite
Mine Frm: M.D. Henry
50-TON PLOT MILL, 7 mi
N Pototai, barite
Mill Frm: H.D. Henry

MONTANA

AMAZON MNG CO
Box 372, Coeur d'Alene,
Idaho
Pres: A.E. Lundon
Sec-Treas: Geo M. Service
MINE, near Heron, Au, Ag, Cu
Mont Agt: Jos Brooks, Norem
Under devel
(See Idaho)

AMERICAN CHROME CO
1 Montgomery St.,
San Francisco 4, California
Pres: Willie A. Swan
VP & Gen Mgr: John Riley
Sec: Geo M. Squirling
Treas: John L. Lukens
Purch Agt: D.W. Graves
MOUAT MINE, Nye, undergr,
chrome conc
Geol: E.S. Rugg
Prod: 1,000 tons
1,000-TON GRAV MILL, Nye,
Table concentration
(See Calif)

**AMERICAN MACHINE &
METALS, INC. TROUT
MNG DIV**
233 Broadway, New York 7,
N.Y.

Pres: C.W. Anderson
Sec: Alphonsus Kenison
Treas: Robert G. Burns
TROUT-ALGONQUIN GROUP,
Phillipsburg, 2 mi E of
Phillipsburg, undergr, Ag, Zn,
Pb, MnO₂
Gen Mgr: Roy McLeod
Asst Gen Mgr: Roy Hamilton
Geol: Frederick D. Owsy
Mine Supt: Thomas Purdie
Prod: 175 tons
TROUT-GRAY MILL
Mill Frm: Kenneth Bager
(See N.Y.)

**AMERICAN SMELTING &
REFINING CO**
JACK WAITE MINE, Sanders
County, Pb, Zn (See Idaho)
Supt: C.H. Blackwell
EAST HELENA PLANT, East
Helena, Custom Lead Smelter
Mgr: S.M. Long
Supt: K.D. Longbridge
(See Ariz, Calif, Colo, Idaho, Ill,
Md, Neb, N.J., N. Mex, N.Y., Tex,
Utah, Wash & Federal Mng &
Smelting Co, Mo)

**ANACONDA ALUMINUM
CO**
Columbia Falls
Pres: R.B. Caples
VP: C.H. Steele
Sec-Treas: C.E. Moran
Purch Agt: A.D. Harris
Gen Supt: E.O. Woster
REDUC PLANT, Columbia Falls,
Al
Mgr: James F. Smith
Scheduled Prod: 120,000,000 lbs
AL REDUCTION PLANT,
Columbia Falls,
Prod: 60,000 tons
Gen Supt: E.O. Woster
(See N.Y.)

ANACONDA CO, THE
Butte
VP: Chg West Oper: C.H. Steele
Gen West Counsel:
W.M. Kirkpatrick
Asst to VP: J.H. Dickey, Jr.,
E.D. Tierney
Pers Mgr, West Oper:
John C. Kearns
Asst Sec-Treas: D.R. Nelson
Mgr of Mines: E.I. Renouard
Gen Supt of Mines: A.R. Sims
Ch Geol, Mont Div: E.P. Shea
Geol, Butte Mines:
C.C. Goddard, Jr.
Ch Mng Eng: F.W. Strandberg
Ch Sampler: F.K. Ramsey
Dir, Mng Research:
E.R. Hurchard
Ch Research Eng: L.F. Bishop
Ch Mech, Elec Eng:
C.J. Lundberg
Mech Supt: George Lilly
Ch Draftsman: Marcus McCanna
Asst Mech Supt: Paul M. Young,
Frank Ralph
Elec Supt: Merton Callow
Chems of Bureau of Safety:
H.A. Wendel
Ch Ventilation-Industrial
Hygiene Eng: J.W. Warren
West Purch Agt: F.W. Switzer
Labor Bureau, Cln Dept:
Eugen Hogan, Mgr,
V.J. Kyllingstad, Asst Mgr
Dist Traf Mgr: W.L. Kennedy
Ch Assayer: W.C. Gallagher, Jr.
Supt, Washoe Sampler:
Dennis E. Leary
Frm, Precipitation Pit:
J.P. Ryan
Layout Eng: R.P. Corbett
Asst Gen Supt, (KELLEY MINE):
M.K. Hannifan
Asst Gen Supt, (MT CON, EMMA,
STEWART): W.R.C. Russell

Asst Gen Supt, (BERKELEY,
ALICE PIT, HORN ORE,
BADGER, LEXINGTON):
E.O. Bonner
Asst Gen Supt, (ANSELMO,
ORPHAN GIRL): V.D. O'Leary
Asst Gen Supt, (LEONARD,
BELMONT, FIRE FALL,
PRECIP PIT): H.M. Struck
Pit Supt: G.W. Parker
Pit Frnt: E.E. Morris
Mng Eng, Pit Oper:
John F. Dougherty
ALICE PIT, Butte dist, Zn
Asst Gen Supt: E.O. Bonner
ANSELMO MINE, Butte dist,
Zn, undergr
Asst Gen Supt: V.D. O'Leary
Mine Supt: Sam Heatherley
BELMONT MINE, Butte dist,
undergr, Cu
Asst Gen Supt: H.M. Struck
Mine Frnt: John Kelsar
BERKELEY PIT, Butte dist,
open pit, Cu
Asst Gen Supt: E.O. Bonner
Supt: G.W. Parker
Frm: E.E. Morris
Mng Eng: J.J. Dougherty
EMMA MINE, Butte dist,
undergr, Mn Zn
Asst Gen Supt: W.R.C. Russell
Frm: William Kerruish
HORN ORE MINE, Butte dist
Asst Gen Supt: E.O. Bonner
Frm: J.J. Canavan
KELLEY MINE, Greater Butte
Proj, Butte dist, Cu
Asst Gen Supt: M.K. Hannifan
Mine Supt: John Killoy
LEONARD MINE, Butte dist,
undergr, Cu
Asst Gen Supt: H.M. Struck
Mine Supt: Russell Powell
LEXINGTON MINE, Butte dist,
undergr, Zn
Asst Gen Supt: E.O. Bonner
Mine Supt: Dan Griffin
MOUNTAIN CON MINE, Butte
dist, undergr, Cu
Asst Gen Supt: W.R.C. Russell
Mine Supt: John Suttle
STEWART MINE, Butte dist,
undergr, Cu
Asst Gen Supt: W.R.C. Russell
FIRE FILLING DEPT
Asst Gen Supt: H.M. Struck
Frm: James Baird
GREAT FALLS REDUCTION
WORKS, Great Falls
Mgr: F.S. Welmer
Gen Supt: J.J. Ingvalson
Asst Gen Supt: L.C. Powell
Mech Supt: C.R. Hill
Met: R.J. Lapee
Ch Clerk: W.P. Sneddon
ELECTROLYTIC & FURNACE
COPPER REFINERIES
144,000 & 138,000 tons per year
Supt: S.R. Weigard
Asst Supt: G. Caldwell
EAST HELENA SLAG
TREATING PLANT
Supt: R.L. Thompson
Asst Supt: A.B. Kane
ANACONDA REDUCTION
WORKS, Anaconda
Mgr: W.A. Emanuel
Gen Supt: F.H. Day
Asst Gen Supt: J.B. Moore
Proj & Dev Eng: C.M. Holstrom
Supt Emp Relations:
C.F. Milkwick
Supt Concentration:
F.A. Roeder
Supt Smelting: E.S. Kramlick
Supt Rev: E.O. O'Leary
Supt, Con & Casting:
J.T. O'Donnell
Supt, Dust Treat:
J.J. Dougherty
Supt Zinc Plant:
F.A. Salomonson
Supt Roasters: A.C. Higley, Jr.
Supt Zinc Electrolyt & Casting:
K.O. Sweeney
Supt Phos & Acid Plants:
K.F. Ruckwardt
Supt Mng Plants: E.O. Strommen
Dir Met Research:
F.L. Holderreed
Asst Dir Met Research:
R.E. Sullivan
Testing Eng: T.G. Fulmer
Met: J.H. McCrea
Ch Chem: E.N. Boyce
Mech Supt: R.P. McCareen
Supt Const: M.A. Stokke
Ch Draftsman: E.F. Dimick
Hygiene, Vent Eng: H.P. Morris
Safety Eng: W.J. Nordham
Supt, Slag & Tailings Disposal:
J.A. Grant
Supt Tram: I.C. Gosses

Supt. Emp: F X Darich
Supt Surface Dept: J F Sladish
Supt Fire & Watch Dept:
J J Dillon
Supt. Repair Foundry:
H M Hansen
COPPER CONCENTRATOR
38,000 tons per day
ZINC CONCENTRATOR
4,000 tons per day
MANGANESE CONCENTRATOR
1,500 tons per day
COPPER SMELTER
150,000 tons per year
ELECTROLYTIC ZINC PLANT
85,400 tons per year
SULFURIC ACID
600 tons 60° Bauria Acid per day
TREBLE SUPERPHOSPHATE
100,000 tons per year
MANGANESE MODULATING PLANT
418 S D T per day
PERCHLOROMANGANESE PLANT
2,250 S D T per month
ARSENIC PLANT
1,000 tons white arsenic per month
(See Calif, Idaho, Nev, N Mex, N Y)

ANTONIOLI, PETER & PETER JR
534 S Washington St, Butte
HUNTINGTON MINE, Silver
Butte, Mo
Idle
PHOSPHATE MINE, Highland
dist, phosphate rock
Idle
TZARINA MINE, Butte dist,
Mo, Zn
WHITESALL MINE, Whitesall
dist, Jefferson County, Au, Ag,
Pb, Zn
Idle
SCRATCH ALL & CONTACT MINE, Flint Creek dist, Mo,
Au, Ag, Cu, Pb, Zn
MAYFLOWER MINE

BASIN-JIB MINES LTD
160 Adelaide St, Toronto 1
Ontario
Pres: Denison Denny
VP: J G Plavon
Sec: Margaret B Smith
BASIN JOB MINES, Basin, Mont
466, Boulder, undergr, Au, Ag,
Pb
Idle

BLACK & WHITE MNG CO
331 N Ave W, Missoula
Pres & Gen Mgr: Roger F Little
BROOKLYN MINE, Marville, 4
mi N of Phillipsburg, undergr
& surface, Ag, Pb, Zn, Cu
Under devel
D-G MINE, Marville, Ag, Pb,
Cu, Au, Bi, U₃O₈
Under devel
200-TON FLOT MILL, at mine
(Leased to Treasure State
Uranium Co, Butte & Silver
Butte Mine Ltd., Vancouver BC)

BUTTE COPPER & ZINC CO
35 Broad St, New York 4, NY
Pres: A A Shulare
VP & Treas: Miles Macdonald
Sec: John F Cole
EMMA MINE, 103 Lewisville
Bldg, Butte, undergr, Mo, Zn,
Ag, Pb, Au, Cu
Res Eng: Leonard D Jarrard
(Operated by Anaconda Copper
Mng Co)
(See N Y)

CAPITAL-SEABOARD CORP
(Formerly Capital Uranium Co)
103 E La Plana,
Farmington, N Mex
Pres: Joseph H Corbin
Exec VP: Charles W Yetter
Sec: William A Pope, Jr
Treas: Howard L Corbin
BOULDER IRON MINE, Park
& Sweetgrass Counties, open
pit, Fe
Gen Mgr: Charles W Yetter
Asst Gen Mgr: Ray A Bennett
Under devel
(See Ariz, Idaho, N Mex, Tex,
Utah)

CENTRAL MINES INC
c/o R E Doepfer, Boulder
NELLIE GRANT MINE,
Jefferson County, Clancy & Lunge
Gulch dist, Au, Ag, Cu, Pb, Zn

CHARTER OAK MNG CO
Box 556, Ellipton
CHARTER OAK MINE,
Ellipton, 3 mi S of Ellipton,
undergr, Pb, Ag, Au, Zn
Gen Mgr: J T Bonner
Under devel
50-TON FLOT MILL, at mine
Under devel

CHEM COPPER CO
Three Forks
COPPER CITY MINE, near
Three Forks, Ouide Cu, open
pit

CLIMAX MINE
Box 421, Phillipsburg
Pres: James R Hunter
CLIMAX MINE, Phillipsburg,
Phillipsburg, Mo
Prod: 25 tons

CONTACT MINING CO
524 Washington St, Butte
Pres: Peter Antonoli, Sr
Gen Mgr: Peter Antonoli, Jr
Met: Frank N Antonoli
SCRATCH ALL MINE,
Phillipsburg, undergr, Ag, Zn,
Mo, Pb
HIGHLAND PHOSPHATE MINE,
Butte, 18 mi S of Butte, undergr
& surface, phosphate
Idle

CONTINENTAL RARE METALS CORP
P O Box 109, Hamilton
CONTINENTAL COLUMBIUM MINE,
Ravalli County, Ch, Ta
Under devel

CREIGHTON MINE & MILL
14 No Tracy, Bozeman
Own: R B Farnsworth
EL FLEDA MINE,
Fairweather Mag dist,
Virginia City, undergr,
Au, Ag
Under devel

CRUMB, RAY W
HUMONGER MINE, N. Min
of Avon, undergr, Au, Ag
Under devel
4-TON GRAY MILL
Under devel

CUMMINGS-ROBERTS
139 N Highland Ave,
Los Angeles 26, California
Gen. Mgr: H Evan Roberts
CRYSTAL MT MINE, Box 658
Darby, 26 mi E of Darby, open
pit, Ca₂
Gen Mgr: John W Taber
Mine Supt: Gordon Blackburn
Prod: 600 tons
600-TON HEAVY MED MILL,
Ravalli County,
Assayer-Chem: William Bichel
(See Calif)

DOMESTIC MANGANESE & DEVEL CO
Box 117, Butte
Pres & Purch Agt: J H Cole
VP: S A Pampelly
Sec-Treas: Cathryn C Keith
400-TON FLOT MILL, with
nodulizing oxide and carbonate
ore

ELKHORN MNG CO
Boulder Bank Bldg, Boulder
Pres, Gen Mgr & Purch Agt:
Wade V Lewis
VP: Hugh S Cannon
Sec-Treas: J T Lewis
ELKHORN & FREE ENTERPRISE MINES,
Elkhorn & Boulder,
undergr
Geol: Wade V Lewis
Mine Supt: Harold J Giulio
Under devel

FAITH MNG CO
Box 1681, Helena
Pres: T D Tobin
VP: Vaughn-Rhys
Sec: Blanche Moore
LIBERTY MINE, Barker mag
dist, undergr, Ag, Pb, Zn, Au
Under devel

GARRETT MNG & MLG CO
P O Box 324, Anaconda
Own: Eugene Garrovi
DELTA MINE, Red Lion Mag
dist, undergr, Au, Mo
16-TON-GRAY-CONC-ANAL MILL,
1/4 mi from mine
Under devel

H O MINING CO
Lennep
CUMBERLAND MINE, Meagher
County, Castle Mt dist, Ag, Cu,
Pb, Zn

HALY MOON MNG CO, INC
808 Midland Bank Bldg,
Billings
Pres: George Gony
VP: William G Mount
Sec-Treas: Harvey Guary
HALY MOON MINE, Big
Timber Creek, Sweet Grass
County, undergr, Pb, Ag, Au
Gen Mgr: George Gony,
Wm G Mount
Under devel

HAND MINE
Argentina
Ora & Oper: John Hand, Dillon
MAULDEN MINE, Argentina
dist, Ag, Au, Pb, Cu, Zn
Mine Supt: Bill Hand, Dillon
IRON MT CLAIMS adjoining
mine
Own: John & Bill Hand

HERA EXPLORATION CO
Box 4, Clinton
Pres: W H Pillatos
VP: Dr W J Collings
Sec: George Ames
HIDDEN TREASURE MINE,
Clinton, undergr, Cu, Ag,
Au, Pb
Gen Mgr: W H Pillatos
Geologist: Dave Hintzman
Under devel
FLOT MILL, Clinton Mining
& Milling Co, Clinton
Mill Supt: W H Pillatos
Assayer: Dave Hintzman
(See Wash)

HERB, F E
Box 368, Dillon
CHARTER OAK MINE, Blue
Wind dist, Beaverhead City,
Ag, Pb

LEAHY LEASING CO
508 Aluminum St, Butte
ALTA MINE, near Jefferson
City, open pit, Au, Ag, Cu, Pb,
Zn

LEE & WARD INC
Box 6, Jefferson City
Pres: Paul R Lee
VP: Virgil Ward
Sec: Clyde Bradley
PRICKLEY PEAR MINE,
Jefferson City
producing now placer

LEHMAN, WALTER
Box 780, Lewiston
Gen: Walter Lehman
SIR WALTER SCOTT MINE, 70
mi W of Lewiston, undergr, Ag,
Pb, Cu, Zn, Au
Under devel

AMERICA MINE, 25 mi NE of
Lewiston, undergr, Pb, Ag, Au,
Fluorine
Under devel
WAR EAGLE MINE, 20 mi E of
Lewiston, undergr, Zn, Pb, Ag
Under devel
CHRISTOPHER COLUMBUS MINE,
undergr, Au, Ag, Pb, Cu
Idle

GOLD BUG MINE, undergr,
Au, Ag, Cu
(Leaser)
Under devel

LISBON URANIUM CORP
304 1st Security Bldg,
Salt Lake City, Utah
BICE LEASE, undergr, U₃O₈
FRYOR MTN MINE, undergr,
U₃O₈
Mgr: R L Christie
Geol: James E Andrus
Mine Frm: J T Highsmith
Prod: 38 tons per day
(See Colo, N Mex, Utah, Wyo)

LITTLE ROCKIES MNG & DEVEL CO
Landusky
Pres: Frank B Bryant
VP: Edward F Wiegand
Sec & Treas: Cecil Flinders
Purch Agt: Marion Heller
LITTLE BEN MINE, Landusky,
undergr, Au, Ag
Gen Mgr: Marion Heller
Supt: E E Wiegand

Geol: Barney Egli
Prod: 100 tons
100-TON FLOT & CYAN MILL,
Landusky
Gen Mgr: Marion Heller
Mine Eng: Frank B Bryant

LIVELY MINING CO
Box 96, Melrose
Pres: R D Lively
VP: Burr Lively
NECLA MINE, undergr, Pb,
Zn, Au, Ag

LUKE, RUSSELL B
1021 E Front St, Butte
JACK PINE PHOSPHATE MINE,
9 mi NE of Ellipton, undergr,
Under devel
LUKE'S SILICA QUARRY, 8 mi
W of Anaconda, open pit

MINERALS ENG CO
MONTANA TUNGSTEN DIV
Box 94, Glen, Montana
Pres: R O Sullivan
VP: J L Robinson
Sec: E B Adams
Treas: Glen Wilson
Gen Mgr: E T Burwell
Asst Gen Mgr-Purch Agt:
R W Warren

CALVERT TUNGSTEN MINE,
7 mi W of Wise Riv, open pit,
WO
Under devel
CARTER IRON MINE, 8 mi E
of Dillon, Fe
Idle
1,000-TON FLOT MILL, 3 mi
NW of Glen

MINERALS EXPLORATION DEVEL CO
Box 41, Bozeman
Pres: Peder Strom
VP: John Jarvinen
Sec & Gen Mgr:
Thomas G McGrath
MINE, (Lease) & Bond on
various claims), undergr,
placer, Au, Ag, WO
Gen Mgr: T G McGrath
Geol: Emilie Abodie
Mine Supt: Peder Strom

MINERAL MNG & MLG CO INC
Box 41, Bozeman
Pres: Peder Strom
VP: Joseph J Almirall
Sec-Treas: Thomas G McGrath
ASBESTOS DEPOSIT, undergr,
open pit, placer, Asbestos, Au,
Cu, Sn, WO
Gen Mgr: Thomas G McGrath
Asst Gen Mgr: Barney Pech
Geol: Robert Crawford
Metall: Emilie R Abodie
Prod: 50 tons asbestos per day
(placer)
Under devel
50-TON GRAY MILL, at mine
Mill Supt: Don Bonowich

MONGAR & SONS
Clinton
GOOD LUCK MINE, Butte,
undergr, Au
Under devel

MONTANA IRON MINING CO
P O Box 423, Stanford
Pres: Dewey F Whitaker
VP & Treas: Lemuel G Wingard
Sec: Gail H Whitaker
Purch Agt: Norman Nelson
DEWEY MINE, open pit, Fe
Supt: Norman Nelson
Prod: 1800 tons
MILL, 18 mi S of Stanford

MONTANA MNG & MLG CO
P O Box 608, Helena
VP & Gen Mgr:
Jack Vandenberg
Sec-Treas: Jean H Hilmen
EMPIRE GROUP MINE, Hilmen,
Marysville dist, undergr, Au,
Ag, Pb, Cu
Gen Supt: T Vern Miller
Geol: Richard Miller
Prod: 150 tons
FLOT MILL, Hilmen
Under devel

MONTANA PHOSPHATE PROD
Garrison
Pres: W G Jewitt
VP: F E Burnett

Sec: E G Randall
GRAVELEY, GIMLET & LUKE MINES, 9 mi NW of Avon,
ROCK MINE, 9 mi NW
Garrison, undergr, open pit,
phosphate rock
Gen Supt: F E Burnett
Mines Supt: C W Noon
Geol: L V Bell
Mines Acct: N Aked
Mines Angr: A M Scott
Mines Frm: C R McDonald
L Brander, L Koon
Under devel
Prod: 1500 tons daily

MONTANA STANDARD MNG CO
Wallace
Pres: Loy L Vose
MONTANA STANDARD MINE,
Prospect Cr dist, Sanders City,
Ag, Pb, Zn, Au, Cu

MUS BROS
Cooke
Ope: R B Mus, V E Mus
BIG BLUE, ST JUDE, GT RIFT, undergr, Ag, Pb, Zn
(Nelson-Lease)
Under devel

NANCY LEE MINES, INC
410 Main St, Kellogg,
Idaho
NANCY LEE GROUP,
Superior, undergr, Ag, Cu,
Pb, Zn
KING & QUEEN MINES, Ag,
Cu, Pb, Zn
125-TON FLOT MILL
Idle

NAT'L LEAD CO, BAROID DIV
Box 1575, Houston 6,
Texas
GREENOUGH PLANT, jigging,
grinding
Mine & Mill Supt: J P Murphy
(See Ark, Calif, Colo, Kans,
La, Mont, Mo, N Y,
Tenn, Tex, Wyo)

NEW MINE SAPPHIRE SYNDICATE
Box 563, Billings
YOGO SAPPHIRE MINE, Yogo
Gulch dist, near Lewiston,
Sapphires
Under devel

NIKI MNG CO
Wheatland
NIKI MINE, 10 mi E of Butte,
Mo
Under devel

NONPAREIL MNG CO
801 Milwaukee Ave,
Deer Lodge
Pres: Marvin Trask
Sec-Treas:
Claude H Bielenberg
NONPAREIL MINE, 8 mi E
of Marville, undergr open
pit, Pb, Ag, Au
Idle

NORTH STAR GROUP A
RFD 1, Toston
Own-oper: Roy E Nicolls
BLACKHAWK & NORTHSTAR MINES, RFD, Toston, undergr,
Ag, Au, Pb, Zn
Under devel

NORTH WESTERN MNG & EXPL CORP
535 136th St, Seattle 68,
Wash
Pres: Albert L Workman
VP: Lyman Battery
Sec-Treas: James E Williams
THIRD TERM MINE, Powell
County, undergr, Pb, Cu, Au,
Ag, Zn
Gen Supt: James E Williams
Under devel
(See Utah, Wash)

NORTHERN MNG & MLG CO
Zeriman
Pres: Paul I Raber
VP: Loren Anderson
Sec: C L Foster (Mng),
Wm C Davis (Mng)
Treas: P C Bakken
RAWKEYE MINE, Little
Rockies dist, Au, Ag, Cu
RUBY GULCH, Ag, Ag, Au, Sb
(Leased from Gold Reserve Mng
Co, Box 541, Bozeman)

NUCLEAR FUELS & RARE METALS CORP INC

Pocatello, Idaho
Pres: DB Lewis
MINE, in Lemhi Pass area on Continental Divide between Idaho & Mont, Ta, Ch, Ta, Rare Earths
Under devel
(See Idaho)

P K F M & B CO

c/o Frank Burgess, Atty,
Butte
MAJOR BUDD MINE, Rampart Mt dist, near Butte, Au, Ag, Pb, Cu

PLANET EXPLOR CORP

123 18 Metropolitan Ave,
Kew Gardens, Queens, NY
MINE, U₃O₈

RADON RESEARCH CORP

Boulder
Pres & Purch Agt:
Wade V Lewis
VP: Theodore Nyquist
Sec-Treas: J T Lewis
URANIUM MT MINE, Boulder INDIANHEAD URANIUM MINE, Basin, undergr, U₃O₈
Geol: Wade V Lewis

RALLS & HARRIS BEGS

P O Box 114, Radersburg
IRON CROSS MINE, Broadwater County, open pit, Fe
Prod: 45 tons

RALLS, JOHN M & ELSTIE L

P O Box 114, Radersburg
NORTH BUTTE MINE, Radersburg, undergr, Pb, Au, Ag
Under devel

RELYEA, GEORGE A

Box 88, Garrison
RELYEA MINE, 11 mi N of Garfield, undergr, phosphate
Prod: 3,500 tons
KLINE-SCHMIDT MINE, Winston, undergr, Pb, Ag, Zn, Cu
Gen Supt-Mine Frm:
Wm Hendrickson

ROGERS, NORMAN MNG CO

Box 1719, Helena
MIKE HORSE MINE, 20 mi E of Lincoln, undergr, open pit, Ag, Pb
Under devel

RUSSSEN MNG CO

83 E Park, Butte
Pres & Mng Eng:
Kenneth M Judd
VP & Gen Mgr:
Russell H Luke
Sec-Treas: Harriet Judd
LUKE JUDD SILICA QUARRY, 5 mi W of Anaconda, open pit, silica
Prod: 30,000-40,000 tons per year

ST PAUL LEAD CO

c/o James G Ewells,
Sidney Bldg, Kellogg, Idaho
SNOWSHOE & ST PAUL MINES, Lincoln County, Pb, Ag, Au
Under devel
(See Idaho)

SILVER CRESCENT MNG CO INC

Box 298, Helena
Pres & Gen Mgr:
William A Hall
VP: Louis Poura
Sec: Albert Lundberg
CRESCENT, PEERLESS MINES, 23 mi S of Helena, open pit, undergr, Au, Ag, Cu
60-TON MILL, 24 mi S of Helena

SIMPLON CO, J R FERTILIZER-MNG DIV

Box 912, Pocatello, Idaho
Pres: J R Simplot
VP & Gen Mgr:
W Grant Kilbourne
CENTENNIAL MINE, Montida,

38 mi E of Montida, open pit, phosphate
Gen Mgr: O E Fother
Mine Supt: Dave Aro
MINE Eng: Leonard Garrard
Prod: 2,000 tons - operates summer only
Bee Idaho, Nev, & Warren Dredging Corp in Idaho)

SODAK URANIUM & MNG CO INC

408 S Idaho St, Dillon
OOB MINE, Beaverhead County, Mn, undergr, open cut
Idle

SWANSEA MINES, INC

Box 904, Helena
Pres & Gen Mgr: C L Hewitt
SILVER BELL MINE, 40 mi NW of Helena, undergr, Au, Ag, Cu, Pb
Idle

TAYLOR-KNAPP CO

Box FF, Phillipsburg
Pres: S R Knapp
VP & Gen Mgr: A V Taylor
Sec & VP: AHC Kremer
Mgr: Donald S Johnson
Ch Eng: Charles P Knobel
MOORLIGHT GROUP, TRUE FISSURE & DURANGO MINE, Phillipsburg, undergr, Mn, Ag, Zn, Pb, Au
Mine Supt: Jack B McCoy
Geol & Eng: M D Regan
Ch Asst: Claude Sorenson
Mine Frm: Geo H Raile
100-TON GRAV-MAG MILL, Phillipsburg
Mill Frm: G Kneale
Assay: F S Neal

TRI STATE MINERALS CO

Box 227, Dillon
Own: W K Skousch
KEYSTONE, TREASURE & SMITH TALC MINE, Dillon, open pit, Talc
Div Mgr: J R Fyner
Mine Supt: Ernest Nygren
Geol: C F Joy

UMONT MNG CO, INC

506 Silver Bow Bldg, Butte
Pres: L P Evans, Jr
VP: D D Wheeler, Jr
Treas: R H Wadams
NORWICH MINE, 2 mi W of Butte, undergr, Mn, Ag
Gen Mgr: D D Wheeler, Jr
Res Mgr: Wilbur F Criswell
Mine Supt: Chas S Bissell
LITTLE SARAH MINE, Summit Valley dist, Mn

URANIUM CORP OF AMERICA

527 Falling Bldg, Portland 4, Ore
Pres: Graham Griswold
VP: A L Mather
Sec-Treas: Wm F Meyer
DAILY COPPER MINES, Wickes, undergr, Cu, Pb, Zn, Ag, Au
Mine Supt: Steve J Giulio
Under devel

VARELIA MNG CO

c/o Sam Varelia, 531 Shields Ave, Butte
EASTER MINE, Silver Bow dist, Mn
SILVER CLEFT MINE, Summit Valley dist, Mn

VERILITE MINES INC

Box 152, Hamilton
Pres: Harry R Fleishman, Jr
VP: Robert Holt
Sec-Treas: L D Bryson, Asst MINE, open pit, Vermiculite
Gen Mgr: R Chamberlain
MILL (35 TON), being built at mine
Under devel

VERMILLION URANIUM CORP

c/o Ernest M Hoffman, Thompson Falls
VERMILLION URANIUM MINE, Sanders County, undergr, U₃O₈
Idle

VICTOR CHEM WORKS

Box 1846, Butte
MAIDEN ROCK MINE, Melrose, undergr, phosphate rock

CANYON CREEK MINE, Melrose, undergr, phosphate

Under devel
Supt FCE & Mng Oper:
F B McCoy
Mine Supt: H F Johnson
Asst Mine Supt: H Gale
Mine Frm: E Kuky
Mine Eng: J Seymour
Prod Supt: H F Johnson
(See Illinois)

YELLOWSTONE URANIUM CO

Box 518, Hardin
Pres: A A Moser
VP: Dean Cummings
SHAMROCK MINE, Silverstar, undergr, Cu, Au, Ag
Under devel

YOUNG-MONTANA CORP

2223 1st Ave, Hibbing, Minn
Pres: E A Young
VP: Joseph Lovalla
Sec-Treas: Thomas McCabe
WILLOW CR MINE, Stanford, 18 mi N of Stanford, open pit, Fe

ZODIAC URANIUM INC

306 Nees Bldg, Salt Lake
Pres: Leo G Bateman
Treas: Gladys B Hervey
DIAMOND URANIUM MINE, near Dillon, Pb, Cu, Au, Ag
Geol: Leland J Davis
(See Ariz)

ZOWILITE CO

135 S LaSalle St, Chicago 3, Ill
Pres: J A Kelley
VERMICULITE MTH MINE, Libby, open pit, vermiculite concentrates
Gen Mgr: R A Bleich
Asst Gen Mgr: E D Lovick
Geol: R J Kujawa
Mech Eng: D W Robinson
Met: W Schines
Purch Agt: B J Dorrington
Mine Supt: R J Kujawa
Mine Frm: Orville Thorne
3,000-TON GRAV MILL, near Libby
Mill Supt: Harold Platt
Mill Frm: Walder Baker
(See Ill)

NEBRASKA

AMER SMLTG & REF CO OMAHA SMLTR & REFINERY

Omaha
Mgr: Ray C Shaw
Gen Supt: J C Reinhardt
(See Ariz, Calif, Colo, Idaho, Ill, Kans, Md, Mont, N J, N Mex, N Y, Tex, Utah, Wash & Federal Mng & Smelting Co, Mo)

NEVADA

A & B MNG CO

c/o Caris Graham
P O Box 343, Winnemucca
Own: W C Austin
DELONG (IRON KING) MINE, Humboldt County, Fe

ALA, JOHN F

Montello
GOLD NOTE MINE, Elko County, Pb, Zn

ALA, J F & DAZ, L

Montello
DOLNO MINE, Elko County, Pb, Zn

ALPINE DEVEL CO

c/o Chris Mann, Gardnerville
Pres: Chris Mann
Sec-Treas: W E Slater
ONITE MINE, 16 mi S of Yerington, open pit, Silica Sand, Clay
Under devel

ALTAMONT MNG & URANIUM INC

50 E 10th St, Bountiful, Utah
MINE, Medoc, Au
Gen Mgr: George M Schlein
Reel-Mine Frm:
Robert H T Dunsmore
Under devel
(See Utah, Colo)

AMERICAN CANYON MINES

11 Sandy Circle, Denver 22, Colorado
Own: Harry H Herman
AMERICAN CANYON MINE, Rochester Mining dist, 8 mi E of Orem in American Canyon, undergr, open pit, Ag, Au, Kaelin
Gen Mgr: Harry H Herman, Jr
Asst Gen Mgr: Peter D Wulfschla
Under devel
200-TON GRAV MILL, at mine
REFINERY, at mine
Metal output: 800 lbs of HG daily

AMES, ROY C

ALLIED MINES, Nye County, Calif

ANACONDA COMPANY, THE YERINGTON MINES

Box 1000, Weed Heights
Gen Mgr: A E Millar
Asst Gen Mgr: H R Burch
Mine Supt: C J Houch
Plant Supt: A J Gould
Gen Mine Frm: D K Gill
Gen Plant Frm: F M Meuninger
Ch Clark: H L Chesarek
Pers Superv: K W Humphreys
Storekeeper: R K Owen
Master Mech: R E Bentley
Superv Rep & Maint of Mobile Equip: M G McCallum
Ch Elect: M H Bissett
YERINGTON MINE, 81 mi SE of Reno, surface, Cu
Prod: 12,000 tons
12,000-TON LEACH & PRECIP PLANT
(See Calif, Idaho, Mont, N Mex, NV)

APEX MINERALS CORP

317 Clay Peters Bldg, Reno
Pres: Wm R Noack
VP: Carson Frassin
Sec-Treas: W B Nalamith
Gen Mgr: Fred Vollmar
Gen Supt: Hugh Cameron
Geol: Harry Hughes
Met: Albert Silver
APEX URANIUM MINE, Austin, undergr, U₃O₈
200-TON MILL, Austin

AQUAFIL CO

Box 134, Fernley
Gen Supt: Lowell Smith
AQUAFIL MINE, 35 mi NE of Fernley, diatomaceous earth
CHICK BED MINE, 27 mi NE of Fernley, diatomaceous earth
MILL, Fernley

ARGURIO, ROSARIO

P O Box 1494, Las Vegas
ROSEY MINE, Lincoln County, Au, Ag

ARGENTITE ACCOUNT

c/o H R Humphrey, Silver Peak
MORAWK MINE, Esmeralda County, Au, Ag

ARGENTUM MNG CO OF NEVADA

Box 151, Mina
Pres & Purch Agt: E S Gates
VP-Treas: C E Earl
Sect J A Crowther
Asst Sec: C E Earl
NORTHERN BELLE-HOLMES-MT DIABLO, Candelaria, undergr, open pit, Au, Ag, Pb, Zn
Gen Mgr & Metal: E S Gates, Jr
Asst Gen Mgr: Judd Hancock
Gen Supt: C E Earl
Prod: 250 tons
250-TON-FLOT-CYANIDE MILL, Columbus Marsh

ATLANTA GOLD & URANIUM CO

Box 248, Pioche
Pres: J E Little
VP & Gen Mgr: C E Collins

Sec-Treas: Wm R Robertshaw

Directors: Roy A Hardy, K L Knutting, J E Little, Wm R Robertshaw, C E Collins
ATLANTA MINE, 81 mi NW of Pioche, Atlanta dist, open pit, Au, Ag, U₃O₈
Consult Eng: Roy A Hardy
Under devel

BAKER LAND TRUST

Box 555, Goldfield
Pres: J S Wisdom
VP: E J Dear
Sec: Bob Cosand
Treas: Helen Wisdom
Purch Agt: R C Evans
WEAVER CREEK, LERMAN CREEK PLACERS, Baker, Pb, Ag, Au, Zr, Ti
Gen Mgr: E J Dear
Asst Gen Mgr: Bob Cosand
Gen Supt-Geol-Met:
Walter Van De Mark
Mech Eng: Les Smith
Mine Supt-Mine Eng:
Bill Crowley
Asst Mine Supt-Mine Frm:
Hed Riley
Prod: 50 tons per day
Under devel

BARIUM PRODUCTS, LTD (SUBSID OF FOOD MACH & CHEM CORP)

Battle Mountain
Gen Mgr: G M Stark
Gen Supt: A L Allen
MT SPRINGS & ARGENTA MINE, 22 mi S of Battle Mt, surface, Barite
Mine Supt: James Jury
Mine Frm: C N Lauritzen
Prod: 105 tons
(See Barium Products, Calif; Inter-mountain Chem, Wyo)

BASIC INC

P O Box 4, Gabbe
Purch Agt: R A McDonald Jr
Works Mgr: H P Willard
Works Engr: J P Janhovic
Mine Supt: A M Dixon
Asst Mine Supt: T M Cahill
Mill Supt: F W Menel
Asst Mill Supt: Ray Sutton
GABBS MINE, open pit, Magnesite, Brucite
Prod: 1000 tons per day
FLOT-HEAV-MED MILL, Rotary Kiln & Herreshoff Furnace
(See Ohio)

BLUE DIAMOND CORP

1650 S Alameda St, Los Angeles 54, Calif
BLUE DIAMOND MINE, open pit, gypsum

Works Mgr: H L Walldhausen Jr
Elec Eng: R Dunsen
Maint Supt: F Day
Safety Eng: M Rundall
Admin Asst: K H Zahn
Mill Frm: Frank Raigalinski
Board Plant Supt: E Guthnecht
Loading Supt: S Conner
Qual Control Supt: R H Whitney
Mine Supt: M C Brooks
Asst Mine Supt: J Cain
Prod: 1400 tons per day
(See Calif)

BOEGLE, CARL

P O Box 393, Virginia City
FISHER-MILL-SITE, Storey County, Au, Ag

BOODANICH, PAUL

53 E 4th St, Salt Lake City, Utah
ROSEBUD MINE, Elko County, Pb, Zn

BRADLEY-BADGER CO

28 S Main, Salt Lake City, Utah
DIAMOND JIM MINE, Elko County, Pb, Zn

BRISTOL SILVER MINES CO

218 Felt Bldg, Salt Lake City, Utah
BRISTOL SILVER MINE, Pioche, undergr, Cu, Ag, Pb, Zn
Gen Mgr: Byron S Hardie
Prod: 60 tons per day
(See Utah)

CANAWHA, EMILE

Box 26, Wadsworth
TEXAS 22 MINE, Washoe County,
Au, Ag

CHEMICAL & PIGMENT

765-50th Ave, Oakland 1,
Calif
JUMBO MINE, Nye County, Ba

**COLE, J. B., DOLESAL W
& LAYTON, ALVIN**
Box 238, Battle Mountain
INDEPENDENCE MINE,
Lander County, Au, Ag

**COMBINED METALS
REDUCTION CO., NEVADA
OPERATIONS**

Pioche
Gen Mgr: Paul Gemmill
Asst Mgr: H E Swanson
Gen Mine Supt: R G Lee
CASELTON MINE, 3 mi W of
Pioche, undergr, Zn, Pb, Ag
Ma
Mine From J L Stewart
Idle
COMET MINE, 20 mi W of
Pioche, undergr, Zn, Pb, Ag,
Wc
Idle
700-TON CASELTON MILL,
FLOT-MNS, Zn, Pb, Ag, Ma
400-TON PANACALITE MILL,
(Crushing & grinding, crude
perlite
Mill Supt: C H Lohme
See Utah

CONNERS, MRS

BARRETTA
Box 16, Lovelock
PORTLAND EXT, Pershing
County, Au, Ag

CONSOL EUREKA MNG CO

Eureka
Gen Mgr: Sherman B Winkley
Asst Gen Mgr & Mine Supt:
Frank F Thirion
DIAMOND MINE, 2 mi from
Eureka, undergr, Pb, Ag, Au
Prod: 25-30 tons
(See Utah)

CONSTANT, BENJAMIN

P O Box 1607, Reno
GALENA HILL MINE, Washoe
County, Pb, Zn

CORDERO MNG CO

121 University Ave,
Palo Alto, Calif
VP: S H Williams
CORDERO MINE, McDermitt,
12 mi SW of McDermitt,
undergr, Hg
Gen Mgr: J Eldon Gilbert
Asst Gen Mgr: Verne P Haas
Gen Supt: Bert Mitchell
Supt: Cliff Allig
STORM FRACTION MINE,
Pershing County, Wc
100-TON MILL, at mine
REORT FURNACE, at mine
(See Calif, Idaho)

CORLETT, JAMES D

Beatty
FLAGSTAFF MINE, Nye
County, Au, Ag

CORSIN, STEVE

P O Box 174, Fallon
BIG BEN MINE, Churchill
County, Pb, Zn

COUVOISIER, CHAS H

(OWB)
Box 470, Susanville, Calif
TICK CANYON MINE, Washoe
County, undergr, U₃O₈
Under devel
RED POINTS MINE, Washoe
County, U₃O₈
Genl Waste Dala
Under devel

CROWELL, J IRVING,

JR
P O Box 98, Beatty
CROWELL DAILY MINE,
Nye County, CaF₂

DAKIN, FRED H

2811 Hillside Dr,
Burlingame, Calif
CERVANTITE MINE, 23 mi E
of Lovelock, undergr, Sb
Idle

DATTON CONSOL MINES

P O Box 721, Carson City
Free-Purch Agt-Gen Mgr:
R E Wadman
VP: Laurence Hurre
Sec-Treas: W T Anderson
DAYTON, KEYSTONE, OEST
& NEW YORK MINES, Silver
City, undergr, open pit, Au, Ag
Idle
200-TON FLOT CYANIDE MILL,
Silver City

DE LONGCHAMPS, F J

Box 2244, Reno
TALAPPOSA MINE, 15 mi S
of Fernley, Au, Ag
Idle

DODGE CONSTRUCTION

INC
P O Box 31, Fallon
IRON HORSE GRP, THOMAS-
PARKER BROS MINE,
Pershing County, Pb

DOUBLE KING MINES,

INC
Silver City
SILVER HILL & TARTO MINES
Storey County, Au, Ag

DOUGHERTY, E R

Twin Falls, Idaho
GIANT MINE, Elko County,
Au, Ag

EAGLE-FICHER CO,

INSUL DIV
P O Box 1059, Reno
CLARK PLANT & MINE
22 mi E of Reno, open pit,
discontinuous earth
Gen Mgr: John W Kenny, Jr
Asst Gen Mgr:
Milton Steinheimer
Mine Supt: Clay Smith
Prod: 150 tons per day
150-TON MILL, Clark
Mill Supt: Frank Dedick
LOVELOCK PLANT & MINE,
Box 344, Lovelock, plant 6
mi E of mine, 23 mi W of
Lovelock, open pit,
discontinuous earth
Gen Mgr: John W Kenny, Jr
Asst Gen Mgr:
Milton Steinheimer
Mine Supt: Clay Smith
Prod: 120 tons per day
120-TON MILL, Colorado
Plant Mgr: Ralph W Yocum
Mill Supt: Emmett Spencer
(See Ill, Kans, Ohio, Okla,
Wisc)

EDWARDS, BAKER

Escondido
LASSIE JEAN MINE, White
Pine County, Au, Ag

ELEMENTS INC

P O Box 1008, Carlin
Gen Mgr: M W Keller
COPPER KING MINE &
GOOD HOPE MINE, Eureka
County, Cu

ERS, H M & DOFF, G

P O Box 444, Fallon
SILVER JOE MINE, Pb, Zn

ERRINGTON-THIEL MNG

CO
Ruby Valley
Ow: Oscar W Thiel
BIG MICA MINE, Ruby Valley,
65 mi SW of Wells, undergr
& surface, ruby mica, beryl,
rare minerals
HOLIDAY COPPER MINE, 50
mi S of Wells, undergr &
surface, Cu, Zn, rare
minerals
Under devel

ESTRELLA, EDWARD W

& PHILLIPS, DUDLEY L
2127 McCarran Ave,
N Las Vegas
TORY GRP, Clark County,
Au, Ag

EUREKA CORPORATION,

LTD
Pres: A J Anderson
VP & Man Dir:
Neil O'Donnell
Sec: A C Callow
Treas: J T McWhirter
Purch Agt: Willis A DePaoli
RICHMOND-EUREKA MINE,

2 mi W of Eureka, undergr,
Pb, Au, Ag, Zn
Gen Supt:

Robert H Breckenridge
Mine Supt: Vernon Mann
Mine Eng: Walter Paroni
Idle

FAIRHAVEN URANIUM

MINES INC
Box 161, Lovelock
Pres & Gen Mgr: Gene Jack
VP: Fred M Jaquith
Sec-Treas: B M Andrews
LINCOLN HILL MINE,
Rochester Mng dist, via
Oreana, 20 mi E of Lovelock,
undergr, U₃O₈, Au, Ag
Mine Frm: Ernest Albrecht
Under devel

FARNSWORTH-ELY

**COMBINED METAL
MINES**
Box 1173, Ely
TIPPLE MINE, White Pine
County, Pb, Zn

FIBREBOARD PAPER

PRODUCTS CORP
P O Box 3035, Henderson
HENDERSON QUARRY, Oryssum,
open pit
Mine Supt: George Mayer
Prod: 500 tons per day
(See Calif, Colo)

FLINTKOTE CO, THE

U S LINE PROD DIV
Box 127, Henderson
Nev Mgr: John MacDonald
SLOAN MINE, Sloan, Bon A,
open pit, dolomite
Supt: Geo Rodriguez
APEX MINE, Box 3560,
N Las Vegas, open pit
Plant Mgr: C H Cadwell
Quarry Supt: C R Prince
Frm: John Sanger
(See Ariz, Calif, Tex)

FLOWERS, JAMES R

& MOBLEY, SAM
P O Box 736, Tungsten
BLACKBIRD MINE, Au, Ag

FRAZIER, V C

Box 380, Carlin
RED BIRD MINE, Au, Ag

GARDNER MINES

Box 413, Ely
Gen Mgr: C A Gardner
MINERAL FAHM &
MERRIMAR GPS, 30 mi SE of
Ely, undergr, Au, Ag, Pb, Zn
Idle

GETCHELL MINE, INC

Box 2320, Reno
Pres: George Wingfield
VP & Gen Mgr: N H Getchell
VP & Cons Eng: R A Hardy
Sec-Treas: T L Wilcox
Gen Supt: Keith Kunze
GETCHELL MINE, Golconda,
undergr & surface, WO, Au
Mine Supt: Wm J Newman
Met: Roy Nojima
Prod: 900 tons
1,500 TON FLOT MILL, near
Golconda
Mill Frm: David Kinsel
Assayer: Roy Nojima
Idle

GOLD BANKS MERCURY

CO
442 Aiken St, Winnemucca
GOLD BANKS MINE, Pershing
County, Hg

GOLD EAGLE MINES

Box 705, Tonopah
Mgr: P Walton
SALLY LOUISE MINE,
Emerald County, Au, Ag

GOLDFIELD CONSOL

MINES CO
Box 2520, Reno
Pres: George Wingfield
Exec VP: Willis A Swan
Sec-Treas: Geo M Spradling
(See Calif, Wash)

GOLDFIELD

ENGINEERING ASSN
Box 3431, Las Vegas
Pres: William R Poe
VP: Eldon L Carlisle
Treas: Dir: Walter B Averett
Sec: Margery Carter
Directors: William R Poe,

Eldon L Carlisle,
Walter B Averett,
Harold V Lankford
COLUMBIA MT MINE, 2 mi
N of Goldfield, undergr, Au
REWACONT CYANIDE PLANT,
1/3 mi from mine

GRANO-LITE GOLD

MNG CO
Box 337, Yerington
Pres & Gen Mgr: W E Slater
VP: John W Barrett
Sec-Treas: Lyono L Turner
GRANO-LITE URANIUM MINE,
17 mi SE of Wellington,
undergr, U₃O₈
Idle

GRAVES, OTIS

LOVELOCK HUENKS #1 MINE,
Elko County, Ba

GREAT LAKES CARBON

CORP
Dicalite Dept, Mng &
Mineral Product Div,
P O Box 177, Mina
PLANT NO 3, Basalt, surface
Alumina
Mill Supt: John Graham
(See Calif, Colo, N Mex, Oreg)

GREAT WESTERN MNG

& DEV CO
Searchlight
SOUTHERN NEVADA MINE,
Clark County, Au, Ag

HAMILTON CORP

P O Box 357, Ely
ONETHA MINE, White Pine
County, Pb, Zn

HULLINGER, RUGH B

122 N 3rd St, Tooele, Utah
SWEET MARIE MINE, Lander
County, Cu

HUMBOLDT METALS

33 W 3rd St, Winnemucca
RED BIRD CLMS, Humboldt
County, Pb

INDEX-DALEY MINES CO

118 N Main St, Salt Lake City,
Utah
Pres-Purch Agt:
Charles S Woodward
Under devel
VP: Glen A Finlayson
Sec-Treas: R W Edmunds
INDEX MINE, Wells, undergr,
Ag, Pb, Cu, Au
Gen Mgr: Charles S Woodward
Gen Supt-Mine Supt:
George A Rich
Under devel
(See Utah)

INDUSTRIAL MINERALS

& CHEMICAL CO
6th and Gilman Sts,
Berkeley 10, California
Pres: L R Moretti
VP: W S Cowgill
Sec-Treas: A L Forbes
JUPITER MINE, Lyon County,
open pit, clay
(See Calif)

ISWELL CONST CO, MNG

DIV
Box 2361, Reno
Pres: C V Isbell
Mng Dept: John W Isbell
Ch Eng: H R Noel
Purch Agt: W J Henley
THREE KIDS MINE, open pit,
contract mng for Manganese Inc,
P O Box 684, Henderson, Mn
Supt: Lloyd Sampson
Eng: Manuel Peralto
(See Ariz, Idaho, Utah, Wash)

JACOBS, CARTWRIGHT

& POTTER
Wadsworth
JUMPER MINE, Washoe
County, Au, Ag

JENSEN BROS & STEELE

P O Box 267, East Ely
WILDCAT MINE, Elko County

KENNECOTT COPPER

CORP NEVADA MINES
DIV
McGill
Gen Mgr: J C Kinnear, Jr
Asst Gen Mgr:
M J O'Shaughnessy
Purch Agt: W N Ireland
Div Comptroller: R W Crouser
LIBERTY PIT, VETERAN PIT,

Ruth, open pit, Cu, Au, Ag,

MoS
Pit Supt: Frank Quilici
Ch Eng: L A Green
DEEP RUTH MINE, Ruth,
undergr, Cu, Au, Ag, MoS
Undergr: Mine Supt: R C Nissel
21,000-TON FLOT
CONCENTRATOR,
2 REVERB SHELTER, McGill
Concen Supt: W J Akert
Smelt Supt: E Pesout
Mech Supt: W M Mansfield
Prod: 100,000,000 lbs Cu yrly
NEVADA NORTHERN BV
(Habsid)
Gen Supt: H M Peterson
TRIPP PIT, Kimberly
(Purchased from Consolidated
Coppermines Corp, Kimberly)
(See Ariz, N Mex, N Y, Utah)

KOYEN, WESLEY

Templute
TEMPUTE SILVER MINE,
Lincoln County, Au, Ag

LSE MNG CORP

c/o John A Hedman,
P O Box 313, Pioche
MINE, Lincoln County, Tb, Zn

L & W MNG CO

1128 10th Ave N, Seattle 2,
Wash
Pres: W J Logus
TRENTON CANYON COPPER
MINE, Battle Mt, undergr,
open pit, Cu, Ag, Pb, WO,
Gen Supt: V R Newbury
Genl: Forbes Robertson
Under devel
(See Wash)

LAHONTAN MINES CO

138 N Virginia St, Reno
MINE, Nye County, Hg

LAKESIDE MINING

CO
2630 Plumas St, Reno, Nev
Pres: J V Gargan
VP: C H Hall
Sec: Oscar Frana, Jr
Treas: Frank Chung
LAKESIDE MINE, Pyramide
Lake, Washoe County, undergr,
Ag, Pb
Under devel

MONARCH MINE, Elko,

undergr, Pb, Zn, Ag
Gen Mgr: J V Gargan
Under devel

LE VALLEY, C E

Box 1013, Hawthorne
VICTORY MINE, Nye County,
Au, Ag

LONDON EXTENSION

MNG CO
Beowawe
Pres: Fred C Bishop
VP: R W Fraser
Sec & Gen Mgr: H C Bishop, Jr
Supt & Treas: R B Warmbrodt
GOLDACRES MINE, 30 mi S of
Beowawe, surface, Au, Ag
Supt: E Mahoney
Mine Frm: Angelo Manconi
Prod: 450 tons
450-TON CYAN MLL, at mine
Supt: C E Stewart
Asst Supt: Harold Bohi

LOVESTEDT, CLAUDE B

735 Lake St, Reno
SPRINGMAYER MINE, Pb, Zn

LOWARY URANIUM MINE

CO
680 Mt Rose St, Reno
Pres: Howard E Maus
Sec-Treas: Nella Lowary
LOWARY URANIUM MINE,
open pit,
Prod: 338 dry tons
Under devel

MAGNET COVE BARIUM

CO
Beowawe
FIVE PITS, 23 mi S of
Beowawe, surface, crude
barite
(Leased from Beowawe Barium
Prod Assn)
(See Ark, Tex, Wyo, Mo, Fla)

MAGNUSSEN, MAX

937, W 4th, Winnemucca
AUSTIN JUMBO MINE,
Humboldt County, Au, Ag

MANOWHESE, INC

(Subsidiary of Howe Sound Co)
Box 2008, Henderson
Ch Mgr: Eliza Gates
Gen Supt: Robert A Blake
Purch Agt: L D Richardson
Gen Mgr: William Kendrick
THREE KICK MINE, Las
Vegas Wash Rd, 3 mi E of
Henderson, surface, Mn
Mine Supt: Victor Howard
Ch Plant Eng: R Waters
Mine Eng: C Hawkins
Elec Eng: Russell Frith
Controller: H M Alariz
Prod: 1,000 dry L/T
1,000-TON FLOT MILL, at
mine
Mill Supt: Ed Lowman
(See Howe Sound Co, N.Y.,
Calera/Mng Co, Idaho)

METALS EXPLOR CORP

340 Madison Ave,
New York 16, N.Y.
HAPPY DAY MINE, Pershing
County, Ng

MILLER, FLOYD J
Box 610, Round Mountain
SPARDOME MINE, Mineral
County, CaF₂

**MINERAL MATERIALS
CO**

1145 Westminster Ave,
Alhambra, Calif
Gen Mgr: C W Denton
Ch Eng: M W Redhead
Res Mine Mgr: P W Leidich
Mine Frm: C W Butler
7000-TON MILL, at mine, jaw
crusher, rolls, magnetic
separators
BUENA VISTA MINE, 26 mi
NE of Lovelock, surface, Fe
Prod: 2100 tons per shift
(See Calif)

**MINERVA SCHEELITE
MNG CO**

Box 901, Ely
Gen Mgr: R Stupper
SCHEELITE CHIEF, 30 mi SE
of Ely, undergr, WO₃
Idia
35-TON GRAV MILL, 48 mi
SE of Ely

**MONOLITH PORTLAND
CEMENT CO**

643 S Olive St,
Los Angeles 4, Calif
VP: Hugh D McBride
GOLDSPAR MINE, 28 mi SE
of Beatty, open pit, CaF₂
Supt: Charles Hoffman
P O Box 338, Beatty
(See Calif)

**NAT'L LEAD CO,
BAROID DIV**

P O Box 1675, Houston 1,
Texas
ROBIN MINE, Elko County, Ba
TANDERS MINE, Humboldt
County, Ba
(See Ark, Calif, Colo, La, Mo,
Mont, N.Y., Tenn, Tex, Utah,
Wyo)

**NATIONAL MERCURY
CORP**

11 Sandy Circle, Denver 22,
Colorado
Pres: Harry H Herman, Jr
VP: David L Wulfsberg
Sec-Treas: Peter D Wulfsberg
PERSHING QUICKSILVER
MINE, 22 mi E of Lovelock,
Antelope Springs dist, undergr,
surface, Ng
Gen Mgr: Harry H Herman, Jr
Under devel

**NAVAJO MINERAL FUND
INC**

227 S Fremont St, Las Vegas
Pres-Purch Agt: J J Satin
VP: Phillip T Asaro
Sec-Treas: Ross Satin
LUCKY JOE MINE, Iron Mt
Rd, Eagle Mt mng dist,
Riverside County, Calif, open
pit, Fe
Gen Mgr: J J Satin
Asst Gen Mgr: S M MacKenzie
Geol-Met-Mine Supt:
R Sholto Douglas
Prod: Approx 900 tons per day
(Under devel)
500-TON HEAVY-MED MILL,
Iron Mt Rd
Mill Supt: S M MacKenzie
(See Calif)

**NEVADA IRON ORE CO,
INC**

Lovelock
Pres: H S Thomas
MINE, 25 mi E of Lovelock,
Buena Vista dist, open pit, Fe
(Leased from Southern Pacific
Co)

**NEVADA-
MASSACHUSETTS CO**

Tungsten
Pres: C H Segerstrom
VP: M D Cronwall
Treas: M D Jones
Gen Mgr: E Nash
TUNGSTEN MINE, 9 mi N of
Mill City, undergr & surface,
WO₃
Mine Supt: D O Keefe
Mine Eng: Ralph Gronning
Idia
600-TON GRAV-FLOT MILL
Mill Supt: J R Caldwell

NEVADA PARK MNG CO

235 S 5th St, Salt Lake City,
Utah
Sec-Treas: Richard Knight
NEVADA PARK MINE, Silver
Park Mng dist, Lincoln County,
undergr, Au, Ag
Idia
(See Utah)

NEVADA PERLITE CO

1118 Industrial Road,
Las Vegas
Pres: James H Bradford
VP: J A Tiberti
Sec-Treas: George Von Tobel
PERLITE PROCESSING PLANT,
Las Vegas
Capacity: 10,000 cu ft
expanded perlite
per day

**NEVADA RAWHIDE MNG
CO**

114 College Ave, Cheney, Wash
Pres: Clarence Davis
VP: Cline E Tedrow
Sec: Arthur Colyar

**NEVADA SCHEELITE
CORP (Subsidiary of KENNAMETAL
INC)**

430 S Main St, Fallon
Pres: Donald C McKenna
VP & Gen Supt: E M Colwell
Asst Sec & Purch Agt:
Geraldine Marsh
Asst: Monte Loxaux
Geol & Asst Supt: Jack Frank
Mech Eng: H L Colwell
NEVADA SCHEELITE MINE,
Rawhide, undergr WO₃
Mine Supt: Harry Manny
150-TON GRAV FLOT MILL, at
mine
Mill Supt: Mark Campbell

**OLD ENGLISH GOLD
CORP**

c/o Joseph Mafen,
148 S 4th St, Provo, Utah
SHOE MINE, Nye County,
Au, Ag

**OLSON, VIRGIL &
ASSOC**

P O Box 749, Winnemucca
HAPPY DAY MINE, Pershing
County, Ng

OVERFIELD, CHARLES

314 Garces, Las Vegas
CROWN POINT GLOBE MINE,
Nye County, Au, Ag

**PARADISE
QUICKSILVER CO INC**

c/o J H Robinson,
101 Ord Blvd, Rampo,
Idaho
PARADISE (BUCKSKIN PEAK)
MINE, Humboldt County, Ng

PEER, GALE C

Box 156, Austin
CAHILL MINE, Lander
County, Au, Ag

**PETERSON, G A,
HUNTER, H & KUNDE, F**

P O Box 326, Mina
NEW POTOMI MINE, Mineral
County, Pb, Zn

**PETERSON, M F &
LOHENA**

Box 131, Tonopah
OLD COWGOLD MINE, 60 mi
NE of Tonopah, undergr, Au,

Ag

Under devel
M & M (MERCURY MT) MINE,
47 mi NE of Tonopah, undergr,
Hg
(Optioned to Two States,
Uranium Company, Bountiful,
Utah)

FILKINGTON, HAROLD W

304 Mill St, Reno
EAGLE TUNGSTEN MINE,
Mineral County, WO₃

PILOT MNG CO

c/o J A Barry, 1310 Arapahoe
St, Los Angeles, California
REDWING CLAIM,
Mineral County, Ng

**POTTER, POTTER &
HAXTER**

Battle Mountain
COPPER CANYON MINE,
Lander County, Cu

FRUIT & STOVERS

P O Box 834, Lovelock
MINE, Churchill County, Fe

**PYRAMID TUNGSTEN,
INC**

Contract
MINE, Elko County, WO₃

RED ROCK MINE CO

Flash Lake Valley, Tonopah
Parts: K L Hill, Roy Puccelli,
Emory Bell, Lewis
Pelham, Geo Scott
MINE, open pit, Esmeralda
County, Ng

30-TON GRAV MILL, at mine

REDBIRD LEASING CO
P O Box 578, Lovelock
REDBIRD MINE, Pershing
County, Ng

REED & SONS

P O Box 348, Battle Mt
BOOTSTRAP MINE, Elko
County, Au, Ag

**RICHTER, WILLIAM C,
RICHTER, KENNETH &
RICHTER, DONALD**

P O Box 321, Oroville, Cal
MINE, Esmeralda County
WO₃

RIECK & LAURITZEN

Battle Mt
OVERLOOK GROUP, 5 mi W
of Battle Mt, undergr,
surface, Co, Ni, Cu, Ag, Au,
Pb
Under devel

**RIPPATOS, ROYAL
& GILLIAM, DALE**

Box 6, Manillelo
LOST HOPE CLAIM, Elko
County, Pb, Zn

**ROUND MT GOLD
DREDGING CORP**

Round Mountain
ROUND MOUNTAIN MINE,
Au, Ag, open pit
Gen Mgr: J H Ashley
Supt: Burton Shultz
Prod: 15,000 tons
15,000-TON MILL
Mill Supt: Dan Avery
(Leased from Nevada Porphyry
Gold Mines, Inc, Reno)

RUGGLES, A L & SONS

Cherry Creek
LAUGHING INDIAN GROUP,
3 mi S of Cherry Creek in
Egan Canyon, undergr, WO₃
Under devel

**EXCHEQUER PATENTED
MINES, Au, Ag**

Under devel
URANIUM CLAIMS,
Telegraph mng dist
Under devel

RUSSELL, ALLEN

Box 648, Beowawe
AURORA MINE, Esmeralda
County, Au, Ag

RUSSELL & BALCH

Battle Mt
COPPER BASIN MINE,
Lander County, Cu

SAGERSTROM & HEIZER

Lovelock
MINE, Pershing County, Fe

**SALVI, ROBERT &
WATSON, JOHN**

Box 701, East Ely
VALLEY VIEW MINE,
White Pine County, WO₃

SANDRY, H V

Oregrade
AUSTIN JUMBO MINE,
Humboldt County, Au, Ag

**SCHULTZ, DELBERT &
ELEAZOR**

215-218 Range Ave, Box 378,
Babbitt
DIGMORE MINE, Cu

SCHWIN, GEO

Box 132, Battle Mt
MCCAY MINES, Lander
County, Au, Ag

SHAW, CLARKE C

642 Humboldt St, Fallon
CAMP FARRELL GRP,
Churchill County, Au, Ag

SHELTON BARITE MINE

P O Box 132, Battle Mt
Own: Edith L Shelton
SHELTON BARITE MINES,
Lander County, Ba

**SHIPPER PACIFIC CO
INC**

108 N 3rd St, Las Vegas
SHOW PILE MINE, Pershing
County, Fe, open pit

**SHINLEY, L D &
CHOATE, WM**

1214 W 1st St, Reno
SILVER QUEEN #1, 2,
Washoe County, Au, Ag

**J R SIMPLOT CO
FERTILIZER DIV**

Box 912, Pocatello Idaho
Pres: J R Simplot
VP & Gen Mgr:
W Grant Hiltz
SIMPLOT IRON MINE, 26 mi
S of Pocatello, open pit, Fe
Gen Mgr: O E Fochler
Idia
(See Idaho, & Warren Dredging
Co, Idaho)

**SIMPLOT SILICA
PRODUCTS, INC**

Overton
Mgr: Keith Madell
(See Idaho, Mont)

SIMPSON, LEONARD D

215 E 3rd St, Winnemucca
WIDE AWAKE MINE,
Humboldt County, Au, Ag

SISKON CORP

Box 889, Reno
Pres: H Chesher Sr
VP: E J Schrader
Sec: J E Chesher
Asst Treas: A L Chadek
SISKON MINE, Box 148, Happy
Camp, Calif, open pit, Au, Ag
Gen Supt-VP: H B Chesher Jr
Pit Frm: C W Cousineau
Prod: 300 tons per day
Mill Supt: A L McFarland
Mill Frm: H B West
Main Frm: Ralph W Moody
(See Calif)

**SLOAN, PAUL R &
KINGAARD**

P O Box 43, Chuk Vista,
Calif
WHITE ROCK GRP, Lander
County, Ba

SMITH, CLYDE F

P O Box 131, Fernley
MINE, Au, Ag

SMITH, ERIC

Box 788, Winnemucca
ALABAMA MINE, Humboldt
County, Au, Ag

SMITH, J & SMITH, H

Gen Del, Prineville, Ore
KRISTINE MINE, Elko County,
Cu

SPAR DOME MNG CO

P O Box 108, Gabbs
Supt: Floyd J Miller
SPAR DOME MINE, 30 mi NW
of Gabbs, undergr, CaF₂
Under devel

STANDARD SLAG CO

Box 3, Gabbs
Pres: L A Beeghly
VP: W E Elias
Sec-Treas: W H Kilcawley
Western Mgr: R O Jones
GREENSTONE MINE, 2 mi E
of Gabbs, surface magnesite
Supt: G B Gaylord
Frsm: A C Wood
Prod: 500 tons
300-TON GREENSTONE MILL,
Gabbs, Calcining
Frsm: W C Burnett
IRON MT MINE, Gabbs, open
pit, Fe
Prod: 700 tons
Mine Supt: G B Gaylord
MINNESOTA MINE, Yerington,
open pit, Fe
Prod: 1,000 tons
Supt: J R Harmon
(See Ohio)

STAR DUST MINES, INC

#4, 283 E South Temple,
Salt Lake City, Utah
Pres & Gen Mgr: Fred Cook
VP: Leslie J Batten

Sec-Treas: W N Nance
Purch Agt: M V Nance
STAR DUST MINES, Baker,
Nevada, open pit, quartzite
Mine Supt: Fred Cook
Prod: 4 tons daily
(See Utah)

STILWELL, R H

18 2nd Ave, Salt Lake
City, Utah
MINERAL PERSE MINE,
White Pine County, Au, Ag

STONER & ETCHEVERY

Battle Mt
COPPER CANYON MINE,
Lander County, Cu

STORMY DAY MINES

435 Hillcrest Rd,
San Mateo, Calif
Pres: Robert N Avery
VP: Alfred W Hickney
Sec: M J Schain
STORMY DAY MINE,
Pershing County, undergr,
WO₃
Idia

**STRODE, FRANK A &
STRODE, EMERY D**

Spring Valley Rd, Ely
SILVER CHIP MINE, White
Pine County, Au, Ag

SUNBURST INC

1075 N W Everett St,
Portland 9, Ore
MONARCH CLAIMS, Nye
County, UO₃

**TRADER HORN MINE, Box 940,
Tonopah, Nye County, undergr,
Au, Ag**

Gen Mgrs: J C Young,
K Critchlow
Under devel
(See Ore, Utah)

BUTTEROREN, R F

Box 364-5, Hawthorne
PAST TENSE MINE,
Mineral County, Au, Ag

TRAYNER, LEONARD

Tonopah
SUMMIT KING (TONOPAH KING)
MINE, Nye County, Au, Ag

**TRIANGLE MINES CO,
INC**

426 Bridge St,
Winnemucca
TRIANGLE MINE, 70 mi NW
of Winnemucca, Battle Creek
dist, open pit, Ng

**Under devel
FLOT-MILL, at mine****TRIANGLE MNG CO**

P O Box 864, Winnemucca
RED ORE MINE, Humboldt
County, Ng

TRI-STATE MNG CORP

113 W Myers St.
Holladay
Pres-Gen Mgr-Mech Eng:
J S Winkler
VP: Helen Winkler
Sec-Treas: Jack King
Purch Agt-Ass't Gen Mgr:
Geol-Met-Ass't Mine Supt:
Walter Van De Mark
SILVERHOLE MINE, open
pit, placer, Au, Ag
Gen Supt: Lee Smith
Mine Frm: Jack Fouch
Mine Eng: B C Boone
Prod: 50 tons per day
30-TON MILL, ionic exchange,
ionic migration
Mill Supt: Jack Fouch
Asst Mill Supt: Lee Smith
Mill Frm: B C Boone
Assayer: E Eisenhauer
Walter Van De Mark

TUNOSTEN MT MNG CO

311 Securities Bldg.
Seattle 1, Wash
Pres-Gen Mgr: B W Porter
VP: Emil Motman
Sec: F L Mills
Treas: Raymond G Rayne
Purch Agt-Gen Supt:
Walter E Deighton
TUNOSTEN MT MINE, P.O.
Fallon, 28 mi N of East Gate
Nev, East Gate is 80 mi E of
Fallon on Hwy 880, undergr.
WO₃
Asst Gen Mgr: P D Miller
Geol: Arthur Lakes
Under devel
75-TON FLOT GRAY
MILL, under const

TWO STATES
URANIUM CO

Box 37, Bountiful, Utah
Pres: Dr O K Christensen
VP: Dr W C Lee
Sec: Frank C Williams
Treas: R N Schluter
A & B, M & M MINES, Nye
County, undergr, Ng
Gen Mgr: M B Fagen
Geol: Kenneth McGriffin
Under devel
(See Peterson, M F & Lorena,
and Utah, Wyo)

UNALDE LEASE

1975 Fallada Dr, Reno
Oper-Mgr: John H Uhalde
ALLAND MINE, 28 mi
SW of Elko, undergr, Fe, Ag,
Cu
Under devel
BONNE MINE, 39 mi SW of
Elko, undergr, Cu, Ag
Under devel

UNITED MERCURY CORP

41 East 35 St.
P.O. Box 100, Winnemucca
UNITED (LIQUID METALS)
MINE, Lander County, Ng
PERSHING GRP, Box 384,
Lovellock, Pershing County, NG

UNITED STATES MNG
& MINERALS CORP

Silver Peak
Pres: Samuel L Levine
VP: Bert H Quint
Sec: Manuel J Rothkin
Treas: Florence Q Levine
Purch Agt: James Wilke
CHIO MINE, Goldpoint, undergr,
Au, Ag
TUNGPAH RING MINE,
Tonopah, undergr, Au, Ag
NIVLOC, Silver Peak, undergr,
Au, Ag
Gen Mgr: George Reed
Gen Supt: Phil McGuire
Mine Eng-Geol:
Wm De Carmonat
Mech Eng: Sidney Gibbs
Elec: F McGuire
Elec Eng: P Fuller
Mine Supt: Robert Melton
300-TON-CYANIDE MILL,
Silver Peak
Mill Supt: Phillip McGuire
Asst Mill Supt: S Gibbs
Assayer: Louis Warnino

U S MNG & MLO CORP

Silver Peak
Pres: Samuel Levine
RED ROBIN DIVIDE & NIVLOC
MINE, Esmeralda County,
Au, Ag

U S MNG & MINERALS

CORP
Silver Peak
LIBERTY MINE, Esmeralda
County, Au, Ag
WALLACE, MARTIN
Bunkerville
NADO CRYSTAL MINE,
Clark County, Au, Ag

WALTERS, F E

3780 Clover Way, Reno
REVEGE GRP, Churchill
County, CaF₂

WESTERN SILICA CO

1730 Locust Ravine,
Bakersfield, California
SHOW WHITE MINE, 18 mi S
of Goldfield, undergr, silica
Supt: William Peterson,
Holladay

WESTERN SILICA PLANT,
crushing & sizing plant
Mgr: Irving Feldcamp
(See Calif)

WHEELER MINES CO

1019 Arthur St, Caldwell,
Idaho
Pres: William E Wheelchel
VP: Ralph A Wheelchel
Sec-Treas: Theresa M
Wheelchel
NATIONAL MINE, McDermitt,
Au, Ag
Under devel
(See Utah)

WHITE CAPS GOLD MNG
CO

317 Clay Peters Bldg,
140 N Virginia, Reno
Pres: Carson Fraxazin
Sec-Treas: Walter Malmkirk
WHITE CAPS MINE, Manhattan,
Au, Sb, Hg
Gen Mgr: Hugh Cameron
Gen Supt: Cleveland Charley
Geol & Met: Albert Silver
Under devel
150-TON CYAN MILL,
Manhattan

WILMOT, CHAS W

Star Rt, Box 63 Winnemucca
MAY DAY MINE, Humboldt
County, Au, Ag

WILSON, JESSE R

P.O. Box 598, Sparks
COLDFIELD MINE,
Mineral County, Au, Ag

YOUNG AND
CRITCHLOW

1975 N W Everett St,
Portland 9, Oreg
Own: James C Young,
Kay Critchlow
COALDALE PROPERTY,
Esmeralda County near
Coaldale, undergr, U₃O₈
Idle
PEEPLESS SILVER & GOLD
PROPERTY, near Austin,
Lander County, Au, Ag
Idle

NEW HAMPSHIRE

FOOTE MINERAL CO

18 W Chelton Ave,
Philadelphia 44, Pa
COLD RIVER MINE, Bellows
Falls, at Cold Riv, undergr,
feldspar
Gen Mgr: George Kneass, Jr
(See N C, Pa, Tenn, Va)

TRUSIANI MNG CO

Brunswick, Maine
BERYL MOUNTAIN MINE,
Auriferous, beryl & glass grad
quartz

WHITEHALL CO, INC

445 Park Ave, New York 22,
New York
Pres: V D Dardi
Exec VP & Treas: Harry S
Adams

VP & Purch Agt: F B Verplanck

VP: Jay E Hand
Sec: D F Cunningham, Jr
RUGGLES MINE, Grafton,
surface feldspar, mica, beryl,
quartz
Prod: 30 tons

NEW JERSEY

ALAN WOOD STEEL CO

Conshohocken, Pa
Pres: H R Wood
VP, Oper: W E Boger
Sec: W B Cashmore
Treas: W M Webb
Purch Agt: Clinton Bishop
SCRUB OAKS MINE, Mine
Hill, undergr, Fe
Supt: J P Kertus
Asst Mine Frm: K Sherbink
Gen Mine Frm: S J Usinowicz
Mine Eng: L V Meyers
Master Mech: Joseph Spatcher
3,500-TON GRAY-MAGNETIC
MILL, at mine
Gen Mill Frm: N K Karchmeyer
Assayer: W F McDougal
Eles Pal

AMER SMITG & REFIN

Barber
PENTH AMBOY PLANT
Mgr: G H Weis
Gen Supt: C B Porter
Gen Aris, Calif, Colo, Idaho,
Ill, Kans, Md, Mont, Nebr,
N Mex, N.Y., Tex, Utah, Wash,
& Federal Mng & Smelting
Company, Mo

NEW JERSEY ZINC CO,

THE
150 Front St, New York 38,
New York

Pres: R L McCann
VP, Mng & Engr: S S Goodwin
Mgr: Purch: W C Dunlap
STERLING MINES, Ogdensburg,
N.Y.
Supt: D McKeeble
(See Colo, Ill, N Mex, Pa,
Tenn, Va, Wisc)

SHAHMOON INDUSTRIES,

INC MT HOPE MNG DIV
Box 393, Dover

MT HOPE MINE, undergr,
Bogertown
Gen Supt: Martin Brophy
Ch Eng & Geol:
Robert Hagerman
Office Mgr: Laurence James
Mine Capt: Howard Buckingham
(Prod: 3,000 tons
1,500-TON FLOT MILL, at
mine
Frm: Preston Davenport
Assay: Wooten J Bat
Mill Supt: M S Sousa

U S METALS-REF CO

Subsidiary of AMER METAL

CLIMAX, INC)

61 Broadway, New York 6, NY
Pres: Hugo de Neville
VP: E T Foss, L Cole,
F H Dyke, H A Vogelstein,
J Vuillequien, J Payne, Jr
Sec & Asst Treas: E A Weill
Treas: Donald J Donahue
Dir of Purchases: D Kellher
Control: L S Childs
ELECTROLYTIC SMELTER &
REFINERY, Carteret
Gen Mgr: John Towers
Prod: 170,000 tons Cu per year
25,000,000 on Ag per
year
600,000 on Au per year
(See Amer Metal Climax, Inc,
N.Y.)

NEW MEXICO

AMERICAN SMELTING
& REFINING CO

SOUTHWESTERN
DIVISION

813 Valley Nat'l Bank Bldg,
Tucson, Arizona
Mgr: T A Sveden
Asst Mgr: A C Hall
Ch Geol: Kenneth Richard
GROUND HOG UNIT,
Vanadium, New Mex, undergr,
Pb, Zn
Supt: L H Chapman
Idle

DEMING MLO UNIT

800-TON FLOT PLANT

Supt: B L Rickman
(See Ariz, Calif, Colo, Idaho,
Ill, Md, Mont, Nebr, N.J., N.Y.,
Tex, Utah, Wash, & Federal
Mng & Smelting Co, Mo)

AMERICAN URANIUM

CORP
317 8th St, SW, Albuquerque
Pres: E T Chase
VP: Charles H Lombbo
Sec-Treas: C A Harris
Dir, Ind Rel: A M Cadwell
MINES, Ambrosia Lake dist,
Faro earth
Under devel

ANACONDA COMPANY,

THE, NEW MEXICO

OPERATIONS

Box 638, Grants
Mgr: A J Pith
Asst Mgr: E C Peterson
Gen Mill Supt: W J Roberts
Ch Met: Dale C Matthews
Mine Supt: John P Herndon
Ch Geol: R D Lynn
Mech Supt: T M Fitch
Ch Chem: Jack R Pale
Ch Clark: F G Holmberg
JACKPILE MINE, open pit,
Uranium Ore
Prod: 3000 tons
SECTION 23 MINE, undergr,
Uranium Ore
Prod: 150 tons
3,300-TON LEACHING
PRECIP MILL, Bloomwater
(See Calif, Idaho, Mont, Nev,
NY)

BANNER MINING CO

2042 Conner Stravenue,
Tucson, Ariz
BONNEY-MANILA & MISER'S
CHEST MINES, Lordsburg,
undergr, Cu, Ag
Under devel
(See Ariz)

BIG CHIEF MINES

Box 1134, Lordsburg
Own-Oper: R Gilligan
BIG CHIEF MINE, 4 mi W of
Lordsburg, undergr, Cu,
U₃O₈
Under devel

BLACK RANGE MNG CO

Kington
Pres: J H Schumaker
VP: Pat Bradley
SILVER KING, LADRON,
HEMATITE & TUNGSTON-
SILVER GROUPS,
Kington, undergr, open pit,
Ag, Pb, Zn, Au, Cu, WO₃
Gen Supt: Marion Dempsey
Mine Frm: V A VanWinkle
20-TON FLOT MILL, (Silica,
shalar, Ag: a new process
developed at mill),
Middle-Parcha
Mill Supt: J H Schumaker
Asst Mill Supt: Bill Stall

BRANNAN & FULLER

Box 246, Silver City
Mine Mgr: Ted Brannan
Sec-Treas: Marvin Fuller
ATWOOD & HENRY CLAY
MINES, Box 546, Lordsburg,
Cu, Ag, Au
Gen Mgr: Ted Brannan
Mech Eng: J M Parson
Shift Frm: Leslie Harvell
Pat Humble
Under devel
Prod: 100 tons per day

BROWN & WALLACE

501 Park Ave, Atasc
Pres: A R Wallace
VP: M R Wallace
Sec-Treas: Creighton Brown
BOBCAT MINE, Grants, open
pit, U₃O₈
Gen Mgr: Don Wallace
Asst Gen Mgr: Billy Rose
Wallace
Under devel

CALUMET & HECLA,

INC

1, Calumet Ave, Calumet,
Mich
VP & Gen Mgr: A S Krömer
EXPLORATION OFFICE,
Box 1000, San Mateo Rd, Grants
Party Chief: R W Kliebenstein
Geol: T A Boyden
URANIUM DIV, Box 906, Grants
Branch Mgr:
George McKereghan

Asst Mgr: J H Doyle
Geol: R W Wallace
MARQUEZ MINE, Ambrosia
Lake, undergr, U₃O₈
Prod: 500 tons per day
(See Ill, Mich, N.Y.)

CAPITOL-SEABOARD

CORP
Box 1047, Farmington
JETER (CHARLIE #2) MINE,
Ladron Mts, Socorro County,
U₃O₈, V₂O₅
Prod: 50 tons
Leased to Uteco Uranium Corp,
Bismarck
(See Ariz, Idaho, Mont, Tex,
Utah)

CHAMBERLIN LEASES

Box 271, Magdalena
WALDO MINE, undergr, Zn,
Fe, Cu, Ag, Mn
Gen Mgr: Robert Chamberlin
Ills

COLORADO MINES &

METALS CO

317 8th St, SW Albuquerque
Pres-Purch Agt: E T Chase
VP: Thomas B Morgan
Sec-Treas: L M Chase
Chmn of the Board: L L Stone
PLACER RARE EARTH
PROPERTIES, 13,500 acres in
Taco & Rio Arriba County
(Placer Rare Earth
Properties under lease to
Porter Bros Corp)
Under devel
URANIUM PROPERTIES,
Ambrosia Lake dist

COL-U-MEX URANIUM

CORP

615 Stims Bldg, Albuquerque
Pres: Tom F Harrington
VP: Ed S Ketchum
DOROTHY MAY MINE, Big
Indian Mng dist, San Juan
County, Utah, undergr
Gen Mgr: William R McCormick
Asst Gen Mgr: Russel L Wood
Gen Supt: Robert M Hurst
Geol: Robert R Ward
Mine Supt: David E Axtell
Prod: 100 tons per day
(See Utah)

COPPER CHIEF MINES

INC

c/o T D Smith, Magdalena

MINE, Socorro County, Parliite

DALCO URANIUM, INC

Uranium Center Bldg,
Grand Junction, Colo
Pres: Elliott Rosensvelt
VP: M Rosensvelt
Sec: David Cross
DALCO NO 1 MINE, Grants,
undergr, U₃O₈
Gen Mgr: J E O'Connor
Chmn-Gen Supt: Alex H Beldo
Elec Eng-Ass't Mine Supt:
Don W Wilson
Prod: 1500 tons
(Leased from Mid-Continent
Uranium Corp, Grand Junction,
Colo)

DOOLEY BROS FUMICE,

INC

100 Tulane Dr, NE,
Albuquerque

Pres: G L Dooley

VP: J R Dooley

Sec: M Dooley

Treas: J M Dooley

DOOLEY BROS MINE, Jemco

Mts N of Domingo, open-pit,
pumice

Prod: 600 tons daily

800-TON CRUSHING &

GRADING MILL, Domingo,
pumice

DOTSON MINERALS

CORP

P.O. Box 115, Socorro

Pres: Carl E Dotson

VP: Elton D Tollin

Sec-Treas: William B Noonan

JONES IRON MINE, near

Carrizosa

MACHETTE MINE, near

Henover, open pit, placer, Fe

Gen Mgr: Carl E Dotson

Under devel

DUVAL SULPHUR &

POTASH CO, POTASH

DIV

Box 510, Carlsbad

Res Mgr: J E Tong

Asst Res Mgr: J W Borsch

Ch Eng: B F McGuire

Safety Eng: C E Childers

Purch Agt: J R Smith

MINE, 21 mi NE of Carlsbad,
undergr, potash

Prod: 3,000 tons
Mine Supt: B H Taylor
Mine Frm: J J Gasparich
Mine Eng: H L Shively
FLOT MILL
Mill Supt: W M Bourn
Mill Frm: M H Harrison
(See Ariz, Tex)

FLAYER CO., INC.
Box 1068, Silver City
Pres & Gen Mgr: C E Clayer
LINCHBURG MINE, Socorro
County, Pb, Ag, Au

FARM CHEMICAL RESOURCES DEVELOPMENT CORP
902 W Greene St, P O Box 870, Carlsbad
Pres & Gen Mgr:

E F Kindaviser
VP: G J Talbot, D A McGee
Sec: C F Brannan
Treas: H H Raborn
Purch Agt: W G Hensley
(Acting)

Chmn of Bd: J G Patton
POTASH MINE, Eddy & Lea
Counties near Artesia
Under devel
(Joint venture of Kerr-McGee,
Phillips Petroleum Co and
Nat'l Farmers Union)

FOOD MACHINERY & CHEM CORP - WESTVACO MINERAL PRODUCTS DIV

Star Route Box 24, Grants
FAITH MINE, Grants,
Ambrosia Lake dist
Geol: R J Hayden
Mine Supt: R C Kirchner
Asst Mine Supt: Jack W Spencer
Under devel
(See Calif)

FOUR CORNERS EXPLOR CO

Box 116, Grants
Gen Mgr: Irving Rapoport
Geol: Forrest Fincher
Gen Supt: L D Barry
DOG MINE, McKinley County,
undergr, U₃O₈
Prod: 80 tons per day
HOGAN MINES, undergr,
U₃O₈
Prod: 200 tons
(See Utah, Wyo)

GENERAL PUMICE CORP

Box 448, Santa Fe
Pres: K W Alley
Sec: G J Endres
CULLUM MINE, Prio Mng
dist, open pit, pumice
Prod: 200 tons
200-TON MILL, Santa Fe

GIBALTAR MINERALS

Box 66, Natchita
HORNET & AMERICAN MINES,
Natchita, undergr, Pb, Ag, Zn
Mgr: Lou D Jordan
Geol: Lamont Titchell
Mine Supt: Charles G Gardner
Under devel (will produce
April 1959)
Prod: 85 tons per day
100-TON FLOT MILL
Mill Supt: Lou D Jordan
Assayer: F C Yeager
(See Tex)

GOSSIL MINE CO

P O Box 388, Grants
Own: E P Mos
GOSSIL MINE, MESA TOP #7,
16 mi NW Grants, undergr,
U₃O₈, V₂O₅
1900 tons/month

GREAT LAKES CARBON CORP. MINING & MINERALS PROD DIV PERLITE DEPT

Box X, Socorro
BLANCA VISTA MINE, 4 mi W
of Socorro, surface, perlite
Ch Geol: J W Reinhardt
MILL, Socorro
Mill Supt: Jerry Howell
(See Calif, Colo, Nev, Oreg)

HAYSTACK MT DEVEL CO, (A SUBSID OF SANTA FE RY CO)
80 E Jackson Blvd,
Chicago 4, Ill
Pres: E S Marsh
VP: R O Rydin
Sec-Treas: C A Moeninger

Purch Agt: F J Steinberger
HAYSTACK & POISON CANYON MINES, Previt, open pit,
U₃O₈, V₂O₅
Gen Mgr-Ch Mng Eng:
T O Evans
Gen Supt: C E Stauffer, Jr
Prod: 250 tons
SECTION 23-13-10 & SECTION
25-13-10 MINES, McKinley
County, U₃O₈

HIGHLAND DEVEL CO
P O Box 1213,
Amarillo, Tex
MINE, U₃O₈

HOMESTAKE-NEW MEXICO PARTNERS

P O Box 88, Grants
(Gen Part: Homestake Mng Co
Limited Partners: United
Minerals Co; J H Whitney & Co;
White, Weld & Co; Rio de Oro
Uranium Mines Inc; San
Jacinto Petroleum Co; Clyde
Isaborel)

SECTION 33 MINE, undergr,
Ambrosia Lake, U₃O₈
Gen Mgr: Langdon W Sweet
Geol: Theo Ritzel
Mech Eng: Roger Madson
Met: Clyde Osborn
Mine Supt: Richard J Stoehr
750-TON CARBONATE LEACH
PLANT, 6 mi NW of Grants
Supt: Clyde Garman
Asst Supt: Homer Derrier
Sampling Plant & Yard Frm:

Ruby W Strammier
Plant Met: Fred N Oberg
Ch Chem: John H Wesley
Control Eng: Harvey O Bird
Elec Frm: B W Brown
Mech Frm: Royce M Bricher
(See Homestake Mng Co, Calif,
S D, Utah, Wyo)

HOMESTAKE-SAPIN PARTNERS

Box 98, Grants
Mgr: L W Sweet
SECTIONS 15, 23 & 25
mines, Grants, undergr, U₃O₈
Supt: B T Delicate
Frms: G A McMillan
Eng: E A Graber
Under devel
Prod: 500 tons
1,850-TON MILL, Grants, U₃O₈
Supt: E S Allen
Asst Supt: J Q Jones
Assayer: C Haberman
(See Homestake Mng Co, Calif,
S D, Utah, Wyo, also Sabre-
Pinon Corp, N Mex)

INTERNAT'L MINERALS & CHEM CORP, POTASH DIV

Old Orchard Rd, Shokie, Ill
Pres: Thomas M Ware
VP, Potash Div: H C White
Sec: C M Edwards
Treas: R A Lenon
Gen Mgr: C A Arend, Jr
CARLSBAD POTASH MINE,
Box 71, Carlsbad, undergr,
KC, & K₂SO
Res Mgr: E C Skinner
Gen Supt: C E Pressnell
Geol: R Houglund
Mech Eng: L B Bunnell
Met: W B Dancy
Elec Eng: J Ivy
Mine Supt: M W Karichner
Mine Frm: W F Ecklund
Mine Eng: Adolph Mitterer
Prod: 13,000 tons
13,000-TON FLOT MILL, at
mine
Mill Frm: Dean Owen
Mill Supt: R M O'Flynn
(See Ariz, Colo, Fla, Ill, Maine,
Miss, NC, SD, Tenn, Va, Wyo)

KENNECOTT COPPER CORP CHINO MINES DIV

Hurley
Gen Mgr: E A Slover
Asst Gen Mgr:
J E Richardson
Div Purch Agt: C N Dempsey
CHINO MINES, Santa Rita, open
pit & undergr, Co, MoS
Mine Supt: C J Ballmer
Pit Supt: W E Herkenhoff
Maint Supt: D C Thorne
Mine Eng: H A Wilmeth
Undergr oper idle
FLOT MILL, Hurley
Mill Supt: P D Thayer

Maint Supt: M M McGee
REVERB SMELTER, Hurley
Supt: W H Winn
Asst Supt: W C Dow
(See Ariz, Nev, N Y, Utah)

KERMAC NUCLEAR FUELS CORP
(Owned by Kerr-McGee Oil
Industries, Inc; Pacific
Uranium Mines Corp, Los
Angeles, Calif; Anderson
Development Co, Albuquerque,
N Mex)

Grants
Pres: D A McGee
Exec VP: George H Cobb
Sec-Treas: P A Puttloff
Purch Agt: Guy Swain
5 MINES, Ambrosia Lake,
undergr, U₃O₈
3 Prod: 400 tons daily
3 Under devel
3,300-TON MILL, NON-
EXCHANGE, Ambrosia Lake
Mgr: H R Keil
(See Kerr-McGee, N Mex)

KERR-McGEE OIL IND, INC. NAVAJO URANIUM DIV

P O Box 608, Shiprock
Gen Mgr: M F Bolton
COVE MINES, Cove, Ariz,
undergr, U₃O₈
Mine Supt: Jack Landon
Mine Geol: Billy Stevens
Mine Frm: Vernon Wilsden
Prod: 200 tons per day
500-TON ACID LEACH-
SOLVENT EXTRACTION MILL,
Shiprock
Ch Met: M N Shaw
Gen Frm: Glenn Nofflinger
Ch Chem: A MacAllister
Maint Supt: T E Kyle
Plant Eng: John Shive
(See Ariz, Colo, Ohio, Wyo,
& Kermac Nuclear Fuel, N Mex)

KLANER & ASSOC

327 E Coronado Rd,
Santa Fe
BOYD TSI MINE, Cameron,
Ariz, open pit, U₃O₈
Gen Mgr - Mine Supt:
M W Walcott
Mile
(See Ariz)

LARGO URANIUM CORP

(Subsidi of FOUR CORNERS
URANIUM CORP, Denver, Colo)
230 Mile High Center,
Denver, Colorado
Pres: E H Sanders
VP: Edw L Clark
Gen Supt: Wesley Smith
DIAMOND NO 2 MINE,
915 E Morgan, Gallup, undergr,
U₃O₈, V₂O₅
(See Four Corners Uranium
Co, Utah, Wyo)

LEACH & LEACH

P O Box U, Lordsburg
Gen Mgr: Francis I Leach
Geol: Albert A Leach
LADY FRANKLIN GROUP, Ag,
Au, Mo
COLOMBAL-MIDNIGHT, Cu, Au,
Ag
RESERVATION-MINNEAPOLIS,
Ag, Pb
ALHAMBRA GROUP, U₃O₈, Ag,
Ni, Co
ALASKA GROUP, GOLDEN
LINK GROUP, MALONE GROUP,
Au, Ag
Producing
FLOYD COLLINS GROUP,
White Signal dist, Grant
County, U₃O₈

LISBON URANIUM CORP

304 First Security Bldg,
Salt Lake City, Utah
SAN MATEO DOME PROPERTIES, Ambrosia Lake
Area, U₃O₈
Geol: Bryan F Sorenson
Devel Drilling Program
under direction of E J
Longyear Co
(See Mont, Colo, Utah, Wyo)

LOST CANYON URANIUM & OIL CO

234 First Nat'l Bank Bldg,
Albuquerque
LOUISE & KATHRYN MINES,
undergr
Under devel
(See Colo)

LUCK MNG & CONSTR CO

Box 38, Silver City
Own & Gen Mgr: G K Luck
BOSTON HILL MINE, Grant
County, surface, Mn

LUREX MNG CORP

Box 1058, Silver City
Pres: B R Flack
VP: J Wayne Woodbury
Sec-Treas: John D Flack
IRON KING MINE, Kingston,
open pit, Mn
Gen Mgr: John D Flack
100-TON GRAY JIG PLANT

MAGDALENA MNG & MLO CO

1260 Simms St, Lakewood,
Colorado
MAGDALENA MINE, P O Box
236, Magdalena, 11 mi S of
Magdalena, Mn
Gen Mgr: R M Conrad
Under devel
(See Colo)

MATHIS & MATHIS

P O Box 433, Silver City
**IRON HEAD CLAIM & PEARSON
PIT**, near Pierre, Fe

MEX-TEX MNG CO, INC

Box NN, Socorro
Pres: J E Bishop
Gen Mgr: Ben B Scott
**ROYAL FLUSH & SNAKE PIT
MINES**, Socorro County,
undergr, Ag, Pb, BaSO₄,
CaF₂
Mine Supt: Maynard Byrd

Prod: 150 tons

Under devel

500-TON GRAY MILL

Mill Supt: Frances Williams

MILLITE MNG & DEVEL CORP

3633 Studebaker Rd,
Long Beach 9, Calif
Pres: Floyd Glees
VP: R Haroldson
Sec-Treas: H Robert Summers
NATIONAL DEFENSE MINE,
Hillsboro, Mn

MOLYBDENUM CORP OF AMERICA

Questa
Pres: Max Hirsch
VP: E A Lucas
Treas: Wm B Kuntz
Gen Mgr: A L Grealin
MOLY MINE, 7 mi E of Questa,
undergr, Mo
Supt: Jose Varela
Under devel
200-TON FLOT MILL
Supt: Robert Cret
Idle
(See Calif, Colo, N Y, Pa)

NATIONAL POTASH CO

P O Box 731, Carlsbad
MINE, 30 mi E of Carlsbad,
undergr, Potash
Gen Mgr: T G Ferguson
Asst Gen Mgr: G L Jordan
Elec Eng: D F Parker
Ch Process Eng: B M Fisher
Mine Supt: C E Groesse
4800-TON FLOT MILL, at
mine
Mill Supt: P J Ferrante
(See N Y)

NEW JERSEY ZINC CO

160 Front St, N Y, N Y
VP, Mng & Explor:
S S Goodwin
Sec-Treas: Samuel Riker Jr
EMPIRE ZINC DIV, Hasover,
undergr, Zn, Pb
Acting Supt: C C Small
Idle
(See Colo, Ill, N J, N Y, Pa,
Tenn, Va, Wisc)

ORE REDUCTION CO

Box 922, Lordsburg
Pres: J E James
3774 Sunast Blvd,
Houston, Texas
Clyde Wilkins, Lease mines
SMELTER, 6 mi W Lordsburg
Supt: A C James
Owns: Lee Owens & J E James

OZARK-MANONING CO, MNG DIV

310 West Sixth St, Tulsa 19,
Okla
MINES, CaF₂
(See Colo, Ill, Ohio)

PACIFIC URANIUM MINES INC

1924 White, Grand Junction,
Colorado
Pres: B Silbert
Sec-Treas: I Klubok
SECTION 24 & 25 MINES,
Ambrosia Lake dist, U₃O₈
Ch Geol: H L Redmond
Geol: J H Volgamore, Jr
Prod: 1,000 tons
(Managed by Kermac Nuclear
Corp, Grants)
(See Colo)

PATTON & GALASSINI

Box 288, Bayard
Part: L A Patton,
Gans Galassini
BULLFROG MINE,
CONTINENTAL "A" MINE,
PRINCES MINE, Grant County,
Pb, Zn, undergr
Under devel

PEASE, C C (TRUSTEE)

P O Box 373, Sundance, Wyo
MINE, U₃O₈

FELTON, CLYDE V

P O Box 423, Carlsbad
MINE, Hudspeth County, Tex,
Talc, Soapstone
(See Tex)

PERU MNG CO

Box 309, Silver City
Pres: Morris Blumberg
VP: J H Taylor
Sec: J S Foley, Jr
KEARNEY MINE, Ag, Pb, Zn
Gen Mgr: J W Faust
Mine Supt: W T Dow,
L J Conley
PEWABIC MINE, Ag, Pb, Zn
PERU MILL, Deming
Mill Supt: S T McDee

PHELPS DODGE CORP

Tyrone
HURRO MT BRANCH
Explor
COPPER & RACKET MINE,
Grant County, Cu
(See Ariz, N Y, Tex)

PHILLIPS PETROLEUM CO

Grants
ANN LEE, SANDSTONE, CLIFFSIDE MINES, McKinley
County, undergr, U₃O₈
Gen Supt: A A Pueblo
Geol: H F Pascoe
Maint Supt: C W Gregory
Supt of Mines: R W Jenkins
Adm Supt: G E Karr
Asst Dir, Strategic Minerals
Div: D Arnold
Dist Geol: George Brasher,
Albuquerque, Dean Clark,
Grants, Frank Stugard,
Gallup
Mine Supt: R N Caywood
Mine Eng: G C Mathis
1725-TON MILL, McKinley
County
Mill Supt: A A Pueblo
Process Supt: W O Bice
Tech Supt: J B Owen
Met: H E Dixon
Maint Supt: G W Robinson
Ch Chem: F C Haas

PICKENS, CHARLES H

Mancos, Colo
MINE, U₃O₈

POTASH CO OF AMERICA

Box 31, Carlsbad
Pres: F O Davis
VP & Res Mgr: R G Haworth
Treas: W H Bartlett
Asst to Pres: H N Clark
Purch Agt: A H Beldel
Fed Rel Supt: R H Blackman, Jr
MINE, 21 mi NE of Carlsbad,
undergr, KC
Plant Eng: R R Dabney
Safety Eng: P F Holstein
Gen Supt: R H Knill
Mine Supt: David Rice
Mine Eng: E C Jourdan
Prod: 8,000 tons
8,000-TON FLOT MILL, at
mine
Mill Supt: R E Smith
Asst Mill Supt: P S Jack

RARE METALS CORP OF AMER

1st Security Bldg, Salt Lake City, Utah
 Pres: C L Perkins
 VP & Asst Gen Mgr: M H Kline
 Sec-Treas: Virgil Rittmann
SAN MATEO MINE, Ambrosia Lake dist, Valencia County, undergr, U₃O₈
 Mine Supt: J J Snider
 (See Ariz, Idaho, Utah)

REE URANIUM CORP

Box 1236, Farmington
 Pres: R J Scanlon
 VP: W R Collier
 Sec: John R Mendon
 (See Colo)

RIO DE ORO URANIUM MINES INC

315 Fourth St, SW, Albuquerque
 Pres: W Rodney DeVilliers
 VP: G R Kennedy
 VP: Ray Schultze
 Sec: R P Duncan Arledge
DYSART NO 1 MINE, Ambrosia Lake, undergr, U₃O₈
 Gen Mgr: Ray Schultze
 Genl Harold A Powers
 Met: Clyde Osborn
 Prod: 1100 tons
KE NO 1, Ambrosia Lake, undergr, U₃O₈
 Idle
 MILL (See Homestake - M Mex Partners)

ROGERS & OSBORN INC

3013 10th Ave, Salt Lake City, 3 Dakota
MINE, U₃O₈

SABRE-PINCH CORP

P O Box 1537, Bismarck Bldg, Santa Fe
 Pres: Richard D Bismarck, II
 VP: W R Montgomery
 Sec: George Slover, Jr
 Treas: Hugh M Craigie
 (See Homestake-Sagin Part, N Mex, also Homestake Mng Co, Calif, S Dak, Utah & Wyo)

ST ANTHONY URANIUM CORP

Box 1799, Grand Junction, Colorado
 Gen Mgr: A M Mastrovich
M-6 SHAFT, Valencia County, undergr, U₃O₈
 Gen Supt: Edward Matson
 (See Calif)

SAN CARLOS URANIUM CO INC

P O Box 597, Las Vegas
 Pres: Charles Lujan
 VP: Tony Gutierrez
 Sec-Treas: Chas Lujan, Jr
WINDY NINE MINE, Sabinosa, San Miguel County, open pit, U₃O₈, Vp₂O₅
 Genl & Mine Supt: John Haberl
 Prod: 10 tons
 Under devel

SAN MIGUEL MINES INC

Box 118, Gila
SAN MIGUEL MINE, Gila
25-TON FULLY CRE DISINTEGRATOR, at mine

SCHWENDLER, F & CO INC

504 Railroad St, Juliet, II
NO AGUA MINE, Tazoo County, Perille

SEE-TEE MNG CORP

336 3rd St, Albuquerque
 Pres-Treas: A N McRae
 Sec: Gordon E Young
 Oper Mgr: Harry Anderson
BUCKY #1, Sec 14, Ambrosia Lake, Grants
MESA TOP-MALPAIS MINE, Sec 30, McKinley County, undergr, U₃O₈
 Prod: 188 tons combined
 Gen Mgr: Thomas F Fife

SHIPROCK INDUSTRIES, INC

2800 National Bank of Tulsa Bldg, Tulsa 2, Oklahoma
 Pres: Lee Huey
 VP: Nels W Stalheim
SANOSTEE MINE, P O Box 317, Shiprock, Chuska Mts near Sanostee, undergr, U₃O₈

Vp₂O₅

Gen Mgr: Nels W Stalheim
 Gen Supt: Shannon A Fowler
 Mine Supt: Stanley J Fowler
 (See Colo)

SOUTHWEST POTASH CORP (Subsidiary of AMERICAN METAL CLIMAX, INC)

81 Broadway, New York 6, NY
MINE, Box 472, Carlsbad, 22 mi NE of Carlsbad, undergr, potash
 Gen Mgr: Victor A Zandon
 Plant Eng: Dale L Schrader
 Purch Agt: E W Brooks
 Gen Supt: John Sowers
 Mine Frm: Ted Van Coten
 Mine Eng: Ira Herbert
FLOT MILL, at mine
 Mill Supt: Art Richardson
 Ch Chem: H S Kaplan
 (See American Metal Climax Co, Inc, NY)

STAR MINES

602 W 12th St, Silver City
 Pres & Gen Mgr: David D Osmer
MORNING STAR MINE, undergr, placer, Wyo, BI
 Mine Supt: Louis L Osmer, Jr
 Mills
34-TON GRAV MILL, at mine

TAOS MINERALS CO INC

Box 185, Taos
MINE, Taos County, Perille

THREE BELLS MNG & MFG CO

Box 1075, Lordsburg
 Pres: L J Reagan
 VP: J C Bailey
 Treas: Joan Reagan
SPANISH MINES PROJECT, 11 mi NE of Lordsburg, undergr, Au, Ag, Pb
 Gen Mgr: L J Reagan
 Gen Supt: J C Bailey
 Prod: 35 tons
50-TON CYANIDE MILL, at mine, Au

U S BORAX & CHEMICAL CORP, U S POTASH CO DIV

Carlsbad
 Res Mgr: Earl H Miller
 Asst to Res Mgr: D L Libbey
 Purch Agt: R D Schenck
MINE & REFINERY, 21 mi E of Carlsbad, potash
 Field Supt: John S Wright
 Mine Supt: J C Horne
 Refinery Supt: L A Tillotson
 (See Calif, NY)

U S SMELTING, REFINING & MINING CO

P O Box 688, Bayard
MINE, Fe, Zn
 Supt: G E Cudney
FLOT MILL
 Gen Mill Frm: Gordon T Glover
 (See Alaska, Ariz, Mass, Utah)

UNITED PERLITE CORP

(Partially owned subsid of United Western Minerals Co)
 136 W Palace Ave, Santa Fe
 Pres: E J James
 VP: E B White
 Sec-Counsel: Herbert A Holt
 Treas: J R Davis
 Ch Eng: F D Waliman
 Sales Mgr: W S McKay
MINE, 8 mi N, 18 mi E, Tres Piedras, open pit, perlite
 Prod: 180 tons per day
600-TON-CRUSHING, SCREENING & DRYING MILL, RAILROAD LOADING FACILITIES, Antonito, Colo

UNITED WESTERN MINERALS CO

136 W Palace Ave, Santa Fe
 Pres: Alva A Simpson, Jr
 VP: E B White, Jr
 Sec-Counsel: Herbert A Holt
 Treas: Peter Cable
SEC 31, T-14N, R-9W, Ambrosia Lake, undergr, U₃O₈
 Prod: 250 tons per day
 (This section is dedicated to Homestake-New Mexico Partners)
SEC 8, T-12N, R-9W, Ambrosia Lake, undergr, U₃O₈
 Prod: 150 tons per day
 Ops: Centennial Devel Inc

(Jointly owned by United Western Minerals Co, J H Whitney & Co, White Weld & Co, San Jacinto Petrol Corp)
SEC 22, T-14N, R-9W, Ambrosia Lake, undergr, U₃O₈
 Prod: 1600 tons per day
 Ops: Kermac Nuclear Fuels, Inc

(Jointly owned by Kerr-McGee Oil Ind, United Western Minerals Co, J H Whitney & Co, White Weld & Co, San Jacinto Petrol Corp)
SEC 14, T-12N, R-9W, Ambrosia Lake, undergr, U₃O₈
 Prod: 200 tons per day
 (Starting first quarter 1969)
 Ops: Four Corners Exploration Co
 (Jointly owned by Four Corners Explor Co, United Western Minerals Co, J H Whitney & Co, San Jacinto Petrol Corp)
SEC 36, T-14N, R-10W, Ambrosia Lake, undergr, U₃O₈
 Temporarily idle

(Jointly owned by United Western Minerals Co, J H Whitney & Co, White Weld & Co, San Jacinto Petrol Corp)
SEC 38, (E 1/3) T-14N, R-10W, Ambrosia Lake, undergr, U₃O₈
 Drilled out orebody of undetermined tonnage
 Ops: Phillips Petrol
 (Jointly owned by Phillips Petrol, United Western Minerals Co, et al)

950-TON CARBONATE LEACH PLANT, near Grants
 (Jointly owned by Homestake-New Mexico Partners)
 Gen Supt: Clyde Osborn

VANADIUM CORP OF AMER

430 Lexington Ave, New York, NY
 Pres: W C Keeley
 VP: D W Vilos
 Sec: D A Shriver
 Treas: L C Miller
 Purch Agt: F W Thomas
SEC 36 MINES, McKinley County, U₃O₈, Vp₂O₅
 Mine Frm: Alva Day
 (See Ariz, Colo, NY)

VERMILLION CLIFFS MNG CORP

Box 1537, Flagstaff, Ariz
 Pres: C E Knowles
 VP: R E Darling
 Sec-Treas & VP of Oper: Allen C Tester
SLATE, SILVER KING & RIO GRANDE MINES, Bayard dist, N Mex, undergr, Pb, Zn
 Mine & Gen Supt: Ray Holmquist
 Mine Frm: Uranio Chacon
 Idle
 (See Ariz)

VOGEL URANIUM MINE & EXPLOR CO

Box 3183, Amarillo, Texas
 Gen Mgr: Harold W Vogel
MINE V NO 2, 6, 7 MINES, San Miguel County, open pit, Tecolote Mng dist, U₃O₈, Vp₂O₅
 Asst Gen Mgr: Harold H Ham
 Under devel
 (See Calif)

W C T ENGINEERING CO

P O Box 123, Belen
MINE, U₃O₈
 (See Utah)

WERNER LAKE NICKEL MINES LTD

311-300 Bay St, Toronto, Ont, Canada
 Pres: R C C Hanson
 VP: G D Clarke
 Sec-Treas: G E Kennedy
HENRY CLAY MINE, P O Box 248, Lordsburg, undergr, Cu, Au, Ag
 Gen Mgr: Murray Watts
 (Under sub lease to Brannan & Fuller, Silver City)

WESTWATER CORP

104 Bolom Bldg, Santa Fe
 Pres: J E Brownson
 VP: C C Green, Jr
 Sec: W L Leeds
 Treas: Peter Ortiz V Pino
WESTWATER #1 MINE, Sec 2 T 12N R 10W, McKinley County
 Mine Supt: James H Mallory
 Under devel

ZUNIGA MINES, INC

Box 601, Silver City
 Pres: Douglas B White
 VP: Earl Strong
 Sec-Treas: Frank Light
ZUNIGA MINE, near Fierro, Grant County, surface, Cu
 Prod: 100 tons
LEACHING MILL, at mine

NEW YORK**ALLIED CHEM CORP (GEN CHEM DIV)**

100 Rector St, New York 6
 Pres: I H Foshee
 VP: F J French
 Purch Agt: W L Machmer, Jr
 Mgr Mng Oper: Robt H Dickson
 Asst Mgr Mng Oper: Wilbert J Trepp
 (See Colo, Va)

AMER AGRI CHEM CO, INC

100 Church St, New York 7
 Pres: C M Powell
 VP: B R Richey
 Sec & Treas: Hughes Mayo
 Purch Agt: G E Campbell
 (See Fla)

AMERICAN CYANAMID CO

30 Rockefeller Plaza, New York
 Pres: W G Malcolm
 VP: R B Fiske, Ed Powers, R C Swain, G R Martin, S C Moody, L C Perkinson, A C McLaughlin, A B Clow, K H Kilstein
 Treas: G C Walker
 Sec: R S Kyle
 (See Ariz, Fla, Ga, Va)

AMERICAN MACH & METALS, TROUT MNG DIV

235 Broadway, New York 7
 Chmn of Bd: John C Vander Pyl
 Pres: Charles W Anderson
 VP: I Newton Becker, John S Swenmumson, Ambrose E LaVan
 Comptroller: Glenn A Swenmumson
 Asst Sec: Roy F Stachel, Henry C Deefe
 Treas: Robert G Burns
 Asst Treas: Harry C Anderson, Albert L Ewing
 Asst Sec & Treas: Patricia A Harrington, Wm H Behrens
 Purch Agt: Roy McLeod
 (See Mont)

AMERICAN METAL CLIMAX, INC

61 Broadway, New York 6
 Chmn of Bd: Arthur H Bunker
 Pres: Hans A Vogelstein
 VP: T W Childs, H S Cohen, Frank Coolbaugh, H de Neufville, A J Hertzog, G V Land, J R MacGregor, J Payne, Jr, E T Rose, W G Thomas, Jean Vuillequies, R E Warriner
 Sec: Erwin A Wall
 Treas: Donald J Donahue
 (See Colo, U S Metals Ref Co, N J & Southwest Potash Corp in N Mex, & NY)

AMERICAN SMLTG & REFIN CO

120 Broadway, New York 5
 Chmn of Bd, Pres: J D MacKenzie
 Vice Chmn of Bd: R W Vaughan
 Chmn Finance Committee: Q S Straus
 VP: S D Strauss, N D Bradford, A J Phillips, A A Brown, F H Etchler, R L Jourdan
 Treas: F G Hamrick
 Sec: Harold Howe
 Ory Purch Dept: R L Jourdan
 Mng Dept: Asst to VP: D J Pope
 Res Eng: V I Mann, C E Nelson, J G Pearcey, A J Yeager
 Explor Mgr: C P Flocke
 Ch Geol: L H Hart
 Purch Dept: F H Etchler

Traffic Dept: F L Marwin
 (See Ariz, Calif, Colo, Idaho, Ill, Md, Mont, Neb, N J, N Mex, Tex, Utah, Wash & Federal Mag & Smelting Co, Mo)

ANACONDA ALUMINUM CO

35 Broadway, New York
 Pres: R B Caples
 VP: C H Riegle
 Sec-Treas: C E Moran
 Purch Agt: A D Harris
 (See Montana)

ANACONDA CO, THE

35 Broadway, New York
 Chmn of Bd: C E Weed
 Pres: C M Brinckhoff
 Exec VP: E S McGlone
 VP & Gen Counsel: C J Parkinson
 VP, Charge of Oper: R S Newlin
 VP: R B Caples
 VP, Charge Latin Amer Affairs: T A Campbell
 VP: C H Steele
 VP & Comptroller: W K Daly
 VP & Ch Geol: V D Perry
 Sec-Treas: R E Schneider
 Asst Comptroller: W E Quigley
 Asst Sec-Treas: T E Tatum, D R Nelson, J J Craglin, E Mayo, F M Byrnes
 (See Calif, Idaho, Mont, Nev, N Mex)

BARTON MINES CORP

N Creek, Warren County
 Pres: H H Barton
MINE, near North Creek, open pit, garnet
 Prod: 400 tons
400-TON GRAV FLOT-HEAVY-MED MTL, at mine

BEAR CREEK MNG CO

181 42nd St, New York 17
 (See Ariz, Utah, & Kennecott Copper Corp, N Y)

BESTWALL GYPSUM CO

Akron
MINE, Erie County, Gypsum, undergr
 (See Iowa, Tex, Va, Utah)

BUTTE COPPER & ZINC CO

25 Broad St, New York 4
 Pres: A A Shulare
 VP & Treas: Miles MacDonald
 Sec: John F Cole
 (See Mont)

CABOT MINERALS DIV

Willsboro, Essex County, Wollastonite, open pit

CALLAHAN MNG CORP

100 Park Ave, New York 17
 Pres: J T Hall
 VP: R F Mahoney, P D Wilson
 Sec-Treas: E A Sala
 (Property transferred to Pinnacle Expl, Inc, Colo)
 (See Idaho)

CALUMET & HECLA, INC

60 E 42nd St, New York
 Pres: E R Lovell
 Exec VP: H Y Bassett
 VP & Gen Mgr: A S Kromer
 (See Ill, Mich, N Mex)

CLIMAX URANIUM CO

(Subsidiary of AMERICAN METAL CLIMAX, INC)
 500 Fifth Ave, New York 38
 Sec: L A Cowan
 Treas: Horace A Sawyer
 (See Ariz, Colo, Utah)

CLINTON MET PAINT CO

Clinton
 Pres & Treas: Bruce M Bare
 Sec & Purch Agt: Mrs C K Covell
MINE NO 3, Clinton, undergr, U₃O₈
 Gen Supt: Robert Barry
40-TON MILL, Franklin Spr
 Mill Supt: Ray Chrysler

CYPRUS MINES CORP

485 Lexington Ave, New York
 Pres: H T Mudd
 VP: A R Thomas
 VP & Treas: H S Kye
 Sec: L A Garrett
 Purch Agt: W F Stover
 (See Ariz, Calif, Colo)

DELUCA

938 Constant Ave., Peekskill,
Westchester County
MINE, Emery, open pit

DIBUSO & ELLIS

Box 232, Peekskill
MINE, Emery, open pit

FREEPORT SULPHUR CO

181 E 42nd St., New York 17
Pres: Langbourne M Williams
Chm Exec: Conner C A Wright
Exec VP: R C Mills,
H L Pierman
(See La, N Mex & Nat'l Potash
Co, N.Y., Tex)

GOLDFIELD AMERICAN

DEVELOPMENT, LTD.
123 Williams St., New York 38

GOVERNMENT TALC CO.

INC
c/o R T Vanderbilt Co,
330 Park Ave., N.Y. 17
Pres: F B Vanderbilt
Sec: H B Vanderbilt
Treas: F C Gens
Purch Agt: K J Miles
VANDERBILT MINE, Balmat,
undergr., talc
VP & Gen Mgr: R S McClellan
Mine Supt: J Bulgar
Frm: Leon Typhair
Mine Eng: Geo Erdman
Prod: 480 tons
HOL-TON DRY GRIND PLANT
Mill Supt: Howard Adam

HOLLY CORP

Chrysler Bldg., New York 17
Pres: A H McKee
VP: J O Heaston
(See Idaho)

HOWE SOUND CO

500 Fifth Ave., New York 36
Pres: William M Waver, Jr
VP: F A McGonigle,
W T Holmes, L C Milliken
Sec: C R Skinner
Treas: J F Willmott
(See Manganese, Inc., Nev.
Calera Mng Co, Idaho)

INDUSTRIES & MINES

INC
85 Broad St., New York 4
Pres-Purch Agt: Martin Lasher
VP: William Scott
Sec: P V Frankel
Treas: M Grossman
(See Utah)

INSPIRATION CONSOL

COPPER CO
25 Broadway, New York 4
Pres: P D H Housman
Exec VP: H M Jacob
Sec-Treas: E F Wendt
Purch Agt: A B Harris
(See Ariz)

INTERNAT'L SALT CO.

INC
BETSOFF MINE, 4 mi S of
Genesee, undergr., rock salt
Gen Mgr: T F Courthope
Purch Agt: J A Cooney
Pl Mgr: S Martin
Pl Eng: R Goetz
Elec Eng: D L Moyne
Prod Supt: J J Riordan
Mine Supt: Lawrence Teter
Asst Mine Supt: Lewis Bush
Mine Eng: Chester Truax, Jr
Prod: 4000 tons
(See La, Mich., Pa)

INTERNAT'L TALC CO.

INC
Box 286, Gouverneur
Pres: R H McCarthy
VP: T W Rourke
VP-Sec: S W Tuttle
Treas: P F McCarthy
Purch Agt: A P Loomis
INTERNATIONAL MINE,
Gouverneur, talc
VP-Gen Mgr: F G Kuehl
Mine Supt: David Crawford
Asst Mine Supt: Peter Bocco
Mill Supt: C F Diavendorf
Prod: 480 tons per day

JOHNS-MANVILLE

SALES CORP
22 E 40th St., New York 18
Pres: A R Fisher
VP: K W Huffine
Sec: H M Hall

Treas: R Hackney
Purch Agt: DH Lyons
(See Johns-Manville Products
Corp., Calif)

JONES & LAUGHLIN

STEEL CORP NEW
YORK ORE DIV
Star Lake
HENSON MINES, 32 mi E of
Gouverneur, open pit, Fe
Mgr: R G Fiech
Asst Mgr: A P Peterson, Jr &
M O Peterson
Ch Mng Eng: E M Smoby
Pl Met: E A Eastman
Res Eng: Carl Dvork
Ch Asst: A R Eshbach
Geol: J J West
Ind Eng: F E Woodworth, Jr
Gen Frm, Pth: W P Bach
Gen Frm, Conc: W A Vickers
Gen Frm, Blast: H W West
Gen Frm, Maint: P L Verbitsky
Ch Elec: R F Peterson
Safety Supt: C LaDuc
Prod: 15,000 tons crude
5,000 tons concentrate
GRAY & MAGNETIC
SEPARATOR MILL, at mine
SINTER PLANT, at mine
(See Mich, Minn, Pa)

KENNECOTT COPPER

CORP
161 E 42nd St., New York 17
Pres: C R Cox
VP, Explor: James Boyd
(Bear Creek Mng Co)
VP, Research: Leslie G Jennes
VP, Frank R Milliken
Sec: Paul B Jessup
Treas: E S Ham
Compt: G B Russell
Dir, Eng: F W Chambers
Dir, Ind & Pub Rel:
A S Cheroumy
Counsel: S S Jackson
Gen Purch Agt: L W Shelton
Gen Traffic Mgr: R E Taylor
(See Ariz, Nev, N Mex, Utah
and subsidiaries, Bear Creek
Mng Co, N.Y., Utah; St
Anthony Uranium Corp, Colo,
N Mex)

METAL & THERMIT

CORP
100 Park Ave., New York
(See Va)

MIAMI COPPER CO

61 Broadway, New York 6
Pres: E H Westlake
VP: J H Elliott
Sec-Treas: John G Greenburgh
Purch Agt: R L Beals
(See Ariz)

MOLYBDENUM CORP OF

AMERICA
375 Park Ave., New York 22
Pres: Marx Hiroch
Exec VP: Emil A Lucas
Sec: James S Crawford
Treas: William A Kuntz
(See Calif, Colo, N Mex, Pa)

NATIONAL GYPSUM CO

325 Delaware Ave.,
Buffalo 2
MINE, Fisher County, Tex.
Gypsum
(See Ind, Iowa, Kans, Tex, Va)

NAT'L LEAD CO

111 Broadway, New York 6
Pres: Joseph A Martino
VP: Alfred H Drewes,
Frank J Koegler, David A
Merson, Joseph H Reid,
Wm J Welch
Sec: John B Henrich
Treas: Joseph J Morsman, Jr
Mgr, Mng Dept: G M Wiles
TITANIUM DIV, MACINTYRE
DEVEL, Tahawus, open pit,
ilmenite, Magnetite
Plant Mgr: John G Hall
Asst Plant Mgr: C R Begor, Jr
B Dellinger
Geol: S O Gross
Ch Eng: R I Kingman
Mine Supt: W M Chapman
FLOT-GRV-MAGNETIC
SINTER PLANT, Tahawus
Mill Supt: J Bassarac
(See Ark, Calif, Colo, La,
Mo, Mont, Tenn, Tex, Utah, Wyo)

NAT'L POTASH CO.

SUBSID OF FREEPORT
SULPHUR CO & FITTS-
BURGH CONSOL COAL CO
205 E 42nd St., New York 17

Free: R C Wells

VP: T G Ferguson
Sec-Treas: A F Rothwell
Purch Agt: J A Brewell
(See N Mex)

NEW JERSEY ZINC CO.

THE
180 Front St., New York 38
Pres: R L McCann
VP, Mng & Explor: S S Gendwin
Treas: Samuel Ritar, Jr
(See Colo, Ill, N.J., N Mex, Pa,
Tenn, Va, Wisc)

NEW YORK & HONDURAS

ROSARIO MNG CO
Rm 1855, 120 Broadway,
New York 5
(See subsid Rosario Explor Co,
Colo)

NORBERT CORP

405 Park Ave., New York 22
Pres: Nicolas M Salgo
1st VP: Howard M Plant
VP: Morton S Muller
Compt: Sheldon E Perlman
Sec: Seymour Hance
Treas: Wm H Ross
(See Colo)

P C MGO CORP

P O Box 72, Schenectady
MINE, Gas Hills, Fremont
County, Wyo, open pit, U₃O₈
(See Wyo)

PACIFIC TIN CONSOL

CORP
120 Broadway, New York
(See subsidiary, Feldspar Corp,
Ga, NC, Tenn)

PHELPS DODGE CORP

300 Park Ave., New York 22
Chmn of Bd: L S Cates
Pres: Robert G Page
VP: Cleveland E Dodge,
Walter C Lawson
VP-Comptroller:
J Mills Hawkins
Asst VP-Sec: John E Masten
Treas-Asst Sec: Martin W
Urquhart
Asst Comptroller: Arthur F
Peterson, Kenneth A
Lawrence, J Milton Gilkes
Asst Sec-Asst Treas: Harold R
Dobbs, Robert D Barnhart
Gen Purch Agt: Percy G Lee
Gen Traffic Mgr: James W Lee
Asst Traffic Mgr: Bernard
Pomessa
Asst Gen Traffic Mgr:
Harry Wright
(See Ariz, N Mex, & Phelps
Dodge Ref Corp, N.Y. & Tex)

PHELPS DODGE REF

CORP (Subsid of Phelps Dodge
Corp)

300 Park Ave., New York 22
Chmn of Bd: Louis S Cates
Pres: Robert G Page
VP: Cleveland E Dodge,
Walter C Lawson
VP-Comptroller: J Mills
Hawkins
Asst Comptrollers: J M Gilkes,
K A Lawrence, A F
Peterson
Treas-Asst Sec: M W Urquhart
Asst Sec-Asst Treas:
R D Barnhart, H R Dobbs
Gen Purch Agt: P G Lee
Gen Traffic Mgr: James W Lee
Asst Gen Traffic Mgr:
B Pomessa, N Wright
(See Tex, Phelps Dodge Corp,
Ariz, N Mex)

PINNACLE

EXPLORATION INC
100 Park Ave., New York
Pres: Philip D Wilson
VP: J T Hall
(See Calif)

RAMAPO URANIUM CORP

Warwick
Treas: George Harbut
MINE
Idle

REPUBLIC STEEL CORP

Republic Bldg., Cleveland,
Ohio
OLD BED, HARMONY &
FISHER HILL MINES, Mineville,
undergr., Fe
Mgr: W A Bloomstran
Supt: J R Brennan, Sr,
J R Murphy

Maint Supt: J R Brennan, Jr
Ch Eng: A K McClellan, Jr
Prod: 2,000,000 tons per year
CHATEAUGAY MINE, Lyon Mt,
undergr & surface, Fe
Mgr: W G Cruseberg
Supt: Jos Tolosky, Sr
Ch Eng: P J McManamin
Maint Supt: Gordon Underwood
Elec: Peter Daniels
Prod: 1,250,000 tons per year
CHATEAUGAY MILL,
magnetic
Supt: J R Tolosky, Jr
Ch Chem: J M Scott
Prod: 385,000 tons conc per
year
(See Ala, Mich, Minn, Ohio)

KEYNOLDS MINERALS

CORP
27 William St., New York
Pres: Douglas J Luckhurst
VP: G C Kidland
Sec: Joseph Masopust
Treas: Robert J Siro
(See Colo)

RUBBEROID CO

500 Fifth Ave., New York
MINE, Wheatland Center
(See Va)

RUTILE MNG CO OF FLA

111 Broadway, New York
Pres: Charles C Norris, Jr
VP: John Ross
Sec: A J Dressel Paul, Jr
Treas: Peter E Connell
(See Fla)

ST JOSEPH LEAD CO

380 Park Ave., New York 17
Pres: Andrew Fletcher
VP: C Merrill Chapin, Jr,
Francis Cameron, Felix
E Wormaner, R J Moeha
VP-Treas: George I Brigham
VP-Sales Mgr: Charles R Ince
Asst VP: Robert Ramsey
Lawson Riggs III
Comptroller-Asst Treas:
James G Colvin
Sec: Donald K Lourie
Asst Sec: William J Elliott
Asst Treas: Edward P Merrell
Asst Comptroller - Asst Sec:
William L Murphy, Jr
EDWARDS-BALMAT MINES,
Balmat, La Lawrence County,
undergr., Zn, Fe, Fe
Mgr: Marshall G Jones
(See Mo, Pa)

SHATTUCK DENN MNG

CORP
120 Broadway, New York 5
Pres: Thomas Bardon
Exec VP: Thomas V Tessi
VP: S S Shattuck
Asst VP: T W Newell,
D M Keatts
Sec-Treas: John A Moss
(See Ariz, Colo, Utah)

SOUTHWEST POTASH

CORP (Subsid of THE
AMERICAN METAL CLIMAX,
INC)

161 Broadway, New York 6
Pres: T W Childs
VP: John Payne, Jr, T G Moore,
Thomas E Camp, Jr, F H
Stewart, Jean Vuilleque
Sec: E A Weil
Treas: Hans A Vogelstein
Cont: Herbert S Cohen
(See N Mex)

TEXAS GULF SULPHUR

75 E 45th St., New York
Chmn of Bd: F M Nelson
Pres: C O Stephens
VP: E C Meagher, E F Vander-
Stucken, Jr, C F Fogarty
Purch Agt: R L Carter
(See Tex)

TRI-STATE ZINC, INC

123 Williams St., New York 38
Pres: B F Flynter
VP: V C Allen
Sec-Treas: J H Nicholls
(See Ill, Va)

TUNGSTEN MNG CORP

500 Fifth Ave., New York 36
Chmn of Bd: L W Long
Pres: Wm H Weaver, Jr
VP: F A McGonigle,
H S West, Jr
Sec: C R Skinner
Treas: J F Willmott
(See N.C.)

UNION CARBIDE

NUCLEAR CO, DIV OF
UNION CARBIDE CORP
30 E 42nd St., New York 17
Pres: Lyman A Bliss
VP: Clark E Center,
L M Currie, S J Cromar,
A Q Lundquist, W M Smart,
C O Strother
(See Calif, Colo, Utah, Wyo)

U S BORAX & CHEM

CORP, U S POTASH CO

DIV
39 Rockefeller Plaza,
New York
Pres: J M Geratley
VP & Gen Mgr: P J O'Brien
Sec: W A Ackerman
Treas: R C Dosta
Purch Agt: J C Walker
Asst Gen Mgr: R F Steel
VP & Gen Mgr: Pacific Coast
Borax Co Div: J F Corhill
VP & Gen Mgr: U S Potash Co
Div: D V Parker
VP of Foreign Opr: N C Pearson
VP: Paul Spear
Asst Treas: J H Hatfield
Asst Sec: Gertrude B Stahler
(See Calif, N Mex)

U S GYPSUM CO

Oakfield, Genesee County
MINE, Gypsum, undergr.

UNIVERSAL ATLAS

CEMENT CORP
Clarence Center
MINE, Erie County,
undergr., Gypsum

VANADIUM CORP OF

AMER
420 Lexington Ave., New York
Pres: W C Kealey
VP, Mng: D W Viles
Sec: D A Shriver
Purch Agt: F W Thomas
Treas: L C Miller
(See Ariz, Colo, N Mex)

WAH CHANG CORP

313 Broadway, New York
Chmn of Bd: K C Li
Eng: T K Li
Gen Mgr: J J Strutzel, Jr
Asst Gen Mgr: George Reed
TUNGSTEN REFINERY,
Glen Cove
(See Calif, Colo, Tex)

WESTERN GOLD &

URANIUM, INC
42 Broadway, New York 4
Pres: Russell L Richards
VP: Richard V Wyman
Sec: Harvey B Porter
Chair Board-Treas:
Ralph G Brown
(See Utah)

**NORTH
CAROLINA****ABERNATHY MNG CO**

Rt 3, Spruce Pine
Part: J C Wilson
ABERNATHY MINE, Mitchell
County, undergr., mica

APPALACHIAN

SULPHIDES, INC
107-85 Yonge St., Toronto 1,
Ontario, Canada
Pres: E R E Carter
VP: R P Mills
Sec: G Gutierrez
Treas: G C Andrew
Purch Agt: E L Tomney
ORE KNOB MINE, Jefferson,
undergr., Cu
Gen Mgr: P N Pitcher
Mine Mgr: L P Eckman
Geol: D Kirian
Mine Supt: H R Fowle
Prod: 100 tons per day
800-TON FLOT MILL, Ashe
County
Mill Supt: S Nemeth

B-K ASSOCIATES, INC

Box 314, Franklin
Mgr: Roy Fouts
CAMPELL MINE, Macon
County, undergr., mica

Ohio

BARGER MNG CO

Rt 2, Burnsville
Part: Ozzie Gouge
BARGER MINE, Yancey County,
undergr, mica

BENWOOD MNG CO

Spruce Pine
Part: C F Arrowood
WEST BRANCH MINE, Avery
County, undergr, mica

BIG HAWK MNG CO

Spruce Pine
Part: Frank Phillips
BIG HAWK MINE, Mitchell
County, undergr, mica

BIG RIDGE MICA CO

Spruce Pine
Part: S A Montague
BIG RIDGE MINE, Haywood
County, undergr, mica

BIRCH MNG CO

Plumtree
Sect: Mrs Sam E Vance
BIRCH MINE, Avery County,
undergr, mica

BOLINGER, H. E., DR

Ron 218, Marshall
Oiler: Dr H E Bolinger
MOOREHEAD MINE,
STACKHOUSE MINE, Marshall,
Madison County, undergr,
Barite

BURLESON & SWANN

Spruce Pine
Part: Robert Burleson
CHAMP RAY MINE, Yancey
County, undergr, mica

CAROLINA

PHYOPHYLLITE CO
Greensboro
MINE & MILL, Glendon

DEEKEN MICA CO

Newdale
Pres: Fred Deeken
HARRIS MINE, Yancey County,
surface, mica

DEWELD MICA CO INC

Spruce Pine
Pres: Roy Weld
SPARKS MINE & PLANT,
Mitchell County, surface, mica

DIAMOND MICA CO

Spruce Pine
Mgr: R T Dens Jr
SPRUCE PINE PLANT,
Mitchell County, mica

DOUBLE HEAD MINES

Plumtree
Part: Joe C Vance
LEANING LOCUST MINE,
Avery County, undergr, mica

DUNCAN MNG CO

Spruce Pine
Part: Lewis Aldridge
DUNCAN MINE, Ashe County,
undergr, mica

ELK MNG CO

Rt 3, Newland
Part: Dayton Ingram
ELK MINE, Avery County,
undergr, mica

EMPIRE MICA CO INC

Spruce Pine
Pres: S L Phillips
CLOUDLAND MINE, Mitchell
County, undergr, mica

ENGLISH MICA CO

Spruce Pine
Sect: Roy Gunter
PLANT #1, mica

FELDSPAR CORP. THE

Box 135, Spruce Pine
Pres: R C Lawrence
VP: F S Miller, C P Rogers, Jr
Sec-Treas: Glenn N Blivins
Eng: L L McMurray
MINE, Spruce Pine, surface,
feldspar
Gen Mgr: Carroll Rogers, Jr
Asst Gen Mgr: P C Coletta
Supt: Ralph Hughes
FLOT MILL, Spruce Pine
Supt: Ralph W Hughes
Asst Supt: Carl Burleson
DRY GRINDING MILL,
Burnsville

Supt: P C Coletta
Total Capacity: 1,000 tons
per day
(Subsidiary of Pacific Tin Consol
Corp, N Y)
(See Ga, Tenn)

FOOTE MINERAL CO

18 W Chelton Ave, Phila 44, Pa
Pres: L G Biles
VP: F B Shay
Sect: W Spofford
Treas: J S Gates
Purch Agt: W M Raynor
KINGS MT DIV MINE, Kings Mt,
open pit, Spodumene
Mine Supt: R C Flow
Mine Eng: M Huston
Plant Agt: D R Smith
Gen Mgr: N O Johnson
Asst Gen Mgr & Gen Supt:
E B Gores
Cool: T L Kessler
HEAVY METAL FLOT MILL,
at mine
Mill Supt: T J Albrecht
Mill Frnt: T Gorman
Assayer: M Carpenter
(See Pa, N H, Tenn, Va)

FORTNER & GRINDSTAFF

Spruce Pine
Part: Edward Fortner
BIG CRABTREE EMERALD
MINE, Mitchell County,
undergr, gems

FRANKLIN MINERAL

PRODUCTS CO
Franklin
Mgr: Clyde Clark
MICA PLANT, Macon County,
mica

GREEN, JESSE

Bakersville
Opr: Jesse Green
DAVIS MINE, Mitchell County,
undergr, mica

GRINDSTAFF, FOX, &

PHILLIPS
Rt 2, Burnsville
Part: Paul Grindstaff
DE-WELD PROSPECT, Yancey
County, undergr, mica

HARRIS CLAY CO

Spruce Pine
VP: S W Enlow
Mgr: S W Enlow, Jr
GUSHER KNOB MINE & PLANT,
KAOLIN MINE & PLANT,
Avery County, surface, kaolin

HARRIS MNG CO

Franklin
Part: M E Burleson
HARRIS MINE, Macon County,
undergr, mica

HECTOR MNG CO

Rt 1, Spruce Pine
Part: B G Thomas
BARGER MINE #3, Yancey
County, undergr, mica

HITCHCOCK CORP

Murphy
Treas: F C Bourne, Jr
NANCY JORDAN MINES 2, 3
& PLANT, Cherokee County,
undergr, pyrophyllite, tale

INTERNAT'L MINERALS

& CHEMICAL CORP
Old Orchard Rd, Skokie, Ill
MINE, Kona, open pit, feldspar,
mica
Gen Supt: L W Broeman, Jr
Asst Gen Supt: Robak Thomas
Mine Supt: C Buchanan
Gen Frnt: Clyde Brinkley
Prod: 1,000 tons
MINE, Spruce Pine, open pit,
feldspar, mica
Gen Supt: Charles Hickey
Asst Gen Supt: Claude Thomas
Mine Supt: C Stamey
Prod: 108 tons
FLOT PLANTS, at mines
(See Ariz, Colo, Ill, Pa, Maine,
Miss, N Mex, S D, Tenn, Va,
Wyo)

KINGS MT MICA CO, INC

Box 708, Kings Mt
Pres: James B Preston, Jr
VP: Herschel E Cole
Treas: Roy H Gunter
Sec-Gen Mgr: Paul A Lancaster
PATTERSON MINE, 2 mi NW of

Kings Mt, surface, mica
Prod: 400 tons
400-TON MILL, at mine
Mill Supt: James E White
MOSS MINE, 4 mi SW of Kings
Mt, surface, mica
400-TON MILL, at mine
Mill Supt: Marvin Lancaster
Ore Dressing Eng:
Hugh A Lancaster

LAWSON UNITED

FELDSPAR & MINERAL
CO
Spruce Pine
Pres: R W Lawson
VP: Robert Lawson,
Branch Lawson
Sec-Treas: C D Lawson
MINE, Minpro, open pit,
feldspar, mica
Gen Mgr: Thomas L Lawson

LITHIUM CORP OF

AMERICA INC
Bessemer City
BESSEMER CITY MINE, open
pit, lithium compounds from
woodwaste
Mines Mgr: J N McClure
CHEMICAL PLANT, Bessemer
City
Plant Mgr: R L Nielsen
(See Minn, S D)

LOIS MNG CO

Spruce Pine
Part: S L Phillips
BUCKEYE PROSPECT, Mitchell
County, undergr, mica

MADE, LEMMIE &

CURTIS
Rt 1, Box 141, Danbury
Part: Lemmie Made
MADE MINE, Stokes County,
undergr, mica

MCKINNEY & RIDDLE

Spruce Pine
Part: Will McKinney
NELSON BOONE MINE,
Yancey County, undergr, mica

MICA INVESTMENT

CORP
Laurens
Pres: King Dixon
MILL KNOB MINE, Macon
County, undergr, mica

MILLRACE MNG CO

Box 67, Spruce Pine
Part: C F Arrowood
MILLRACE MINE, Avery
County, undergr, mica

MINERAL & METALS

CORP
Murphy
Sec: F C Bourne, Jr
MULBERRY GAP PLANT &
MINE, Cherokee County,
undergr, pyrophyllite, tale

MITCHELL LUMBER CO

Spruce Pine
Part: Frank Phillips
BANNER MINE, Mitchell
County, undergr, mica

MOODY ROCK MNG CO

Burnsville
Part: Amos Presnell
MOODY ROCK MINE, Yancey
County, undergr, mica

MOUNTAIN MNG CO

Spruce Pine
Part: M E Burleson
JIMMY CUT MINE, Mitchell
County, undergr, mica

OLD ABERNATHY MNG

CO
Spruce Pine
Part: Lewis Aldridge
OLD ABERNATHY MINE,
Mitchell County, undergr, mica

P & N MNG CO

Rt 3, Spruce Pine
Part: S L Phillips
GUDGER MINE, Spruce Pine,
Mitchell County, undergr, mica
TEA CUT MINE, Mitchell
County, surface, mica

PACIFIC TIN CONSOL

CORP
(See N Y, The Feldspar Corp,
N Y)

PHILLIPS, R. B., MNG CO

Spruce Pine
Part: S L Phillips
R B PHILLIPS PROSPECT,
Mitchell County, undergr, mica

SHAWNEE MICA MINES

Box 831, Sylva
Sect: Bob Garrett
BOWERS MINE, Macon County,
undergr, mica

SINK HOLE MNG CO

Rt 3, Bakersville
Part: C W Ellis
SINK HOLE MINE 1 & 2,
Mitchell County, undergr, mica

SLIPPERY ELM MNG CO

INC
Rt 2, Newland
Sect: Dayton Ingram
SLIPPERY ELM MINE,
Avery County, undergr, mica

SOUTHEASTERN MNG CO

Burnsville
Mgr: Nick Raschella
HOPE MINE #2, Yancey County,
undergr, mica

SOUTHERN MICA CO

Johnson City, Tenn
SULLINE MINE, Spruce Pine,
open pit, mica
THOMPSON MINE, Newdale,
Yancey County, surface, mica
Gen Mgr: C Bailey Rice
Gen Supt: George W Edge
Mine Frnt: Cecil Renfro
(See Tenn)

SPARKS, BROWN

Rt 3, Bakersville
Opr: Brown Sparks
BYRD MINE, Mitchell County,
undergr, mica

SPARKS & BUCHANAN

Spruce Pine
Part: Steve Sparks
BIG CLAY HOLE MINE #3,
Mitchell County, undergr, mica

STANDARD MINERAL CO

Hubbards
Pres: F B Vanderbilt
VP: H B Vanderbilt
Sec: Fred Chappell
Treas: F C Gens
Purch Agt: W J Woodward
MINE, undergr, open pit,
pyrophyllite
Gen Mgr: Fred Chappell
Asst Gen Mgr: Roy Harris
Eng: Paul Ward
Mine Frnt: Cecil Horner
FINE GRINDING MILL,
at mine
Mill Frnt: H I. McLaurin
Capacity: 75,000 tons annually

STEIGNER, CLARE

Spruce Pine
Opr: Clare Steigner
ALLENS CREEK MINE, Yancey
County, undergr, mica

STOKES COUNTY MNG CO

Spruce Pine
Part: Lee Medford
SPENCER MINE, Stokes County,
undergr, mica

TUNGSTEN MNG CORP

P O Box 931, Henderson
VP: Gen Mgr: James R Sweet
Gen Supt: W B Atkins
Purch Agt: G V Boyd
Ch Eng: A M Saykalewski
Master Mech: W F Edwards
HAMME MINE, Tungsten,
undergr, WO₃ concentrates,
hubnerite, synthetic scheelite
Mine Supt: E H Roberts
Asst Mine Supt: J W Aher
Mine Eng: Philip A Hager
930-TON FLOT-GRAV MILL,
Tungsten
Syn Scheelite Flt Supt:
Carl F Gammal
Asst Flt Supt: J V Hamme
Mill Frnt: R Lee Angel
Assay: S B Adams
(See N Y)

UNION REFINING & MNG

CO
Box 1347, High Point
Pres: H A Knight, Jr
STAR MINE, Montgomery
County, undergr, As

YOUNG & ARNOLD MNG

CO
c/o Mitchell Lumber Co,
Spruce Pine
Part: Frank Phillips
ARNOLD YOUNG MINE,
Mitchell County, undergr, mica

OHIO

AMERICAN ORE CO

106 E Main St, Plain City
Pres: P H Petty
Sec-Treas: Dr S N Langstaff
Opr under devel
Hg, Pb, Cu, Fe

AMERICAN ZINC OXIDE

CO (Subsidiary of AMERICAN ZINC,
LEAD & SMOKE CO)
1515 Paul Brown Bldg,
St Louis 1, Mo
REFINERY, Columbus
VP & Gen Mgr: A C Elide
Gen Supt: W T Maidens
Purch Agt: C M Chambers
(See Ariz, Ill, Mo, Ohio, Tenn,
Tex, Wash, Wis)

BASIC INCORPORATED

945 Hanna Bldg, Cleveland 15
Pres: H F Ellis, Jr
Purch Agt: G H Rutherford
MAPLE GROVE QUARRY &
PLANT
(Mail: Postoria), Maple Grove,
Seneca County, surface,
dolomite
Works Mgr: A M Catto
(See Nev)

BUTLER BROS (M A Hanna

Co, agents)
1300 Leader Bldg, Cleveland 14
Chmn of Bd: Patrick Butler
Pres: G W Humphrey
VP: R C Fish, J C Rieger
Sec: L W Spang
Treas & Asst Sec: C W Gardner
(See Minn)

CLEVELAND-CLIFFS

IRON CO, THE
1440 Union Commerce Bldg,
Cleveland 14
Chmn of Bd-Pres: W A Sterling
Asst to Pres: Grover J Holt
VP: D R Forrest
VP Mgr: J S Westwater
Exec VP: Finance: H S Harrison
VP: Law: J H Kerr
Exec VP, Sales-Marine:
J S Wilbur
(See Mich, Minn)

CONSUMERS ORE CO

1300 Leader Bldg, Cleveland 14
Chmn of Bd: J H Thompson
Pres: G W Humphrey
VP: R C Fish, J C Rieger
Sec: L W Spang
Treas & Asst Sec: C W Gardner
(See Minn)

CONTINENTAL MINERAL

PROCESSING CORP
1st Nat'l Bank Bldg,
Cincinnati 2
Pres & Gen Mgr:
Frederick A Hauck
VP: Albert E Grogan,
G D Slaughter
Sec: Vincent H Beckman
(See Fla)

DOUGLAS MINING CO

1300 Leader Bldg, Cleveland 14
(M A Hanna Co, Agts)
Chmn of Bd: J H Thompson
Pres: G W Humphrey
VP: R C Fish, J C Rieger
Sec-Asst Treas: S L Engel
Asst Sec: F W Bennett
Treas: H H Bartholmew
(See Minn)

THE EAGLE-PICHER CO,

THE INSUL DIV
American Bldg, Cincinnati 1
Pres: T Spencer Shore
VP: Glen J Christner
Sec: Richard Serviss
Treas: Carl A Geist
-Comptroller: Wm R Dice
LOVELOCK PLANT & MINE,
P O Box 388, Lovelock, Nev,
25 mi W of Lovelock, open pit,
diatomaceous earth,

Gen Mgr: John W Kenney, Jr
Asst Gen Mgr:
Milton Steinheimer
Mine Supt: Clay Smith
Prod: 189 tons
120-TON M&L, Colorado, 6 mi
E of Lovelock
Plant Mgr: Ralph W Yocum
Mill Supt: Emmett Spencer
(See Ill, Kans, Nev, Ohio, Wisc)

M A HANNA CO, THE
1300 Leader Bldg, Cleveland 14
Agent for the following companies:
Butler Bros, Consumers Ore Co,
Douglas Mining Co, Hanna Mng
Co, Hanna Iron Ore Div
(Nat'l Steel Co), Hanna Ore
Mining Co, Morton Ore Co,
Osark Ore Co, Philbin Mining
Co, Richmond Iron Co,
South Agnew Mining Co
(See Mich, Minn, Oreg)

HANNA ORE MINING CO
1300 Leader Bldg,
Cleveland 14
Chmn of Bd: J H Thompson
Pres: R C Fish, J C Rieger,
R W Whitney
Sec-Asst Treas: S L Engel
Asst Sec: F W Bennett
Treas: R H Bartholomew
(See Minn)

HANNA MINING CO
1300 Leader Bldg,
Cleveland 14
Chmn of Bd: J H Thompson
Pres: G W Humphrey
VP: J W Buford, J K Gustafson
Sec: L W Spang
Treas: W C Pieper
Asst Treas: R E Beal,
R H Bartholomew
Asst Sec: L E McChesney,
W C Pieper, S L Engel
(See Mich, Minn)

MONTREAL MNG CO
(See Oglebay Norton & Co, Ohio,
and Montreal Mng Co, Wisc)

MORTON SALT CO
110 N Wacker Dr, Chicago 6,
Illinois
Pres: D Peterkin, Jr.
VP, Prod: R C Vail
Sec: L McBride
Treas: Garfield King
Purch Agt: N L Esthus
Exec VP: H R Stratford
FAIRPORT HARBOR MINE,
Box 390, Painesville, undergr.,
rock salt

Gen Mgr: G G Warren
Asst Gen Mgr: G R Pyle
Mine Supt: R G Ganong
Asst Mine Supt: D D McCormick
Mine Fm: M R Barker
Mine Eng: Robert Ryland
Under devel
MILL, Fairport Harbor
(See Ill, Kans, La)

NAT'L STEEL CORP
HANNA IRON ORE DIV
1300 Leader Bldg, Cleveland 14
Chmn of Bd: J H Thompson
Pres: G W Humphrey
VP: R C Fish, J C Rieger
Asst Secs: S L Engel,
F W Bennett
Treas: R H Bartholomew
Asst Treas: S L Engel
(See Mich, Minn & Osark Ore Co, Mo)

**OGLEBAY NORTON
COMPANY**
1200 Hanna Bldg, P O Box
6508, Cleveland 1
Pres: H S Taylor
VP: W D Hamilton
Sec: G E Guthery
Treas: L H Norton
Purch Agt: C J Howley, Jr
Gen Counsel: J J Dwyer
(See Oglebay Norton & Co, Minn,
& Montreal Mng Co, Wisc)

**PICKANDS NATHAN &
CO**
2000 Union Commerce Bldg,
Cleveland 1
Managing operators for BALKAN
MNG CO, BENNETT MNG CO,
BIWABIK MNG CO, CAMPBELL
MNG CO, CORSICA IRON CO,
CRETE MNG CO, CUYUNA ORE
CO, ERIE MNG CO, HOYT MNG
CO, IRON RANGE MNG CO,
LAKE MNG CO, MAHONING

ORE & STEEL CO, ONTARIO
IRON CO, SAGAMORE ORE
MNG CO, SYRACUSE MNG
CO, UTICA MNG CO,
VERMILLION MNG CO,
WESTERN MNG CO,
YOUNGSTOWN MINES CORP
(See Minn, Mich, Wisc)

REPUBLIC STEEL CORP
25 Prospect Ave, NW,
Cleveland
Pres: T F Patton
VP: E R Johnson
Asst VP: E B Winning
Purch Agt: W T Adams
(See Ala, Mich, Minn, N Y)
RESERVE MINING CO
(Owned by Republic & Armco
Steel Corp)
Guthall Bldg, Cleveland 15
(See Minn)

SOUTH AGNEW MNG CO
1300 Leader Bldg,
Cleveland 14
Pres: A F Peterson
VPs: R C Fish, G W Humphrey
Sec: L W Spang
Treas & Asst Sec: C W Gardner
(See Minn)

**STANDARD SLAG CO,
THE**
1200 Wich Bldg, Youngstown
Pres: L A Beeghly
VP: W E Bliss
Sec-Treas: R M Lynch
Purch Agt: R L Stevenson
Ch Eng: A W Porter
(See Nev)

OKLAHOMA

**AMER ZINC, LEAD &
SMELT CO**
1515 Paul Brown Bldg,
St Louis 1, Mo
RIALTO & BARRARA J MINES,
Box 218, Picher, undergr, Zn, Pb
Dist Mgr: D R Stewart
Gen Supt: O L Green
Mng Eng: W F Hotzendorf
Metallurg: Robt Ammon
Idle
1,200-TON GRAV-PLAT-MILLS
(See Ariz, Ill, Mo, Ohio,
Tenn, Tex, Wash, Wisc)

**BLACKWELL ZINC CO,
INC**
(Subsidiary of THE AMERICAN
METAL CLIMAX, INC)
41 Broadway, New York 6,
New York
Pres: H de Neufville
VP: E T Rose, J Vuillequies,
J Payne, Jr, A E Lee
Sec: E A Well
Treas: D J Donahue
Purch Agt: W F Price
Controller: H S Cohen
SMELTER, Blackwell
Mgr: M L Hugen
Prod: 88,000 tons Zn yrly
(See American Metal Climax, Inc)

BUFFALO MNG CO, THE
Box 241, Picher
Pres: W L Childress
VP: F J Childress, Jr
Sec-Treas: H L Childress
Purch Agt: Wm G Roberts
JOE BUFFALO MINE, 1 1/2 mi
E of Picher, undergr, Zn, Pb
Gen Mgr: H L Childress
Frm: C A Enders
Idle

CONTACT MNG CO, INC
10 E Central Ave, Miami
(Box 348)
Pres: Orville Moore
VP & Gen Mgr: Finis Bryson
Sec: V W Sapp
Treas: G W Sapp
Asst Mgr: Orville Moore
CONTACT MINE (SOUTHSIDE
LEASE) near Cardin, undergr,
Zn, Pb
Idle

CORONADO MINES, INC
208 Wright Bldg, Tulsa 3
Pres: Milton Leon
VP: S P Bowyer
Sec-Treas: A F Bourne
(See Ariz)

CROSSLAND & LYONS
Box 305
Trece, Kansas
CRANE (BLUE BENNETT)
MINES, Zn, Pb

**CROSSLAND, WATKINS
& ALLEY**
Box 221, Trece, Kansas
MCBEE MINE, Zn, Pb
EAGLE-PICHER CO, THE
MNG & SMELT DIV
Box 910 Miami
Pres: T Spencer Shore
VP: O A Rockwell
Asst to Gen Mgr: Claude Dale
Dir Personnel & Labor Rel:
C D Wood
Comptroller: G H Walbert
TRI-STATE MINES, Cardin,
undergr, Zn, Pb, Ge
Gen Mgr: F J Cuddeback
Gen Supt: J B Elzendorf
Asst Gen Supt: L Wetherell
Geol: Douglas Brockie
Chief Eng: R K Stroup
Chief Elec: Claude Rogers
Dir Supts, Maint: C Johnson
Trans: C Mitchell
Mint: M Huddlesum
Bert Paul
W R Sillaway
Idle

**CENTRAL GRAV-PLAT-HEAVY-
MED MILL, Cardin**
Mill Supt: Fred Phelps
ZINC RETORT SMELTER,
Henryetta
Supt: John Wade
Rare Metals Lab: Miami
Prod Mgr: C C Habeger
Dir Research: W Medcalf
(See Ill, Kans, Nev, Ohio, Wisc)

HARRISON GYPSUM, INC
P O Box 176, Lindsay
MINE, near Cement, surface,
gypsum

**KERR-MCGEE OIL
INDUSTRIES, INC**
Kerr-McGee Bldg,
Oklahoma City 3
Pres: D A McGee
VP: F C Love
Sec: S H Robinson
Treas: H H Raborn
Purch Agt: D W Lindsay
(See Ariz, Colo, N Mex, Wyo,
and Kernac Nuclear Fuels,
N Mex)

**MARK TWAIN MNG CO,
THE**
Box 341, Picher
Pres: W L Childress
VP: W H Childress
Sec-Treas & Gen Mgr:
H L Childress
Purch Agt: Wm G Roberts
Mine Fm: C A Enders
JARRETT MINE, 2 mi W & 3 mi
N of Picher, undergr, Zn, Pb
Idle
(See Kans)

**OZARK-MAHONING CO
MINING DIV**
310 West 6th St, Tulsa 19
Pres: C O Anderson
VP & Gen Mgr: A G Johnson
Sec: R T Lindmark
Compt: K R McWilliams
Gen Supt: H E Baile
Supt of Mfg: Wayne W Fowler
Geol: E A Breche
(See Colo, Ill, N Mex)

**PHILLIPS PETROLEUM
CO, MNG & MFG DEPT**
Bartlesville
Mgr: T M Hipp
Tech Asst: Bradley Skinner
(See N Mex, Utah)

ST CLAIR LIME CO
Box 894, Oklahoma City
MINE, undergr, Lime Plant

**SEARCY-HENDERSON
MNG CO**
Box 281, Picher
LASALLE MINE, Zn, Pb

SIMS DEWEY
Box 229, Joplin
CRYSTAL CENTRAL, HUMBAH,
ROBERT LOTTION, RITZ
MINES, Zn, Pb

TONGANA MINING CO
Box 368, Picher
Pres: Clarence A Miller
VP & Gen Mgr: O K Tucker
Sec: W A Brewer
KITTY MINE, 3 mi W of Picher,
undergr, Zn, Pb
Mine Fm: Leslie L Marcus
Idle

TUCK MNG CO
Box 386, Picher
WILSON MINE, Zn, Pb

TULSA MINERALS CORP
Box 5216, Tulsa
Pres & Gen Mgr: J S Burden
VP: P T Thibodaux
Sec & Treas: W G Eastman
Purch Agt: John W Cleary
(See Ariz)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
MINE, BOARD, PROCESSING
PLANT, Southard, Blaine County,
gypsum
Plant Mgr: W B Blosser
Plant Eng-Supt: J R Baker
(See Calif, Colo, Conn, Ind, Ill,
Iowa, Mass, Ohio, S D, Tex, Utah,
Va)

**UNIVERSAL ATLAS
CEMENT DIV, U S
STEEL CORP**
100 Park Ave, New York 17,
New York
WATONGA MINE, Blaine
County, surface, gypsum

S A WALTON & SON
Fairview
MINE, near O'Keene, Blaine
County, surface, gypsum

W M & W MNG CO
Picher
Pres: O K Tucker
VP: F E Williams
Sec-Treas: Ralph Chambers
Purch Agt: O K Tucker
MINE, Ottawa County, Zn, Pb

OREGON

ASHLAND MINING CO
835 N Main St, Ashland
Mgr: Dewey & Fred Van Culer
ASHLAND MINE, 3 mi NW of
Ashland, undergr, Au
50-TON GRAV MILL & CONCEN

AXEHANDLE MINE
San Luis Obispo, Calif
John B Hoffman
MINE near Ashwood, Jefferson
County, Hg
Explor

BOAZ MNG CO
708 Joshua Green Bldg,
Seattle 1, Wash
Supt: I R Maxfield
BUFFALO MINE, Grant County,
Granite dist, undergr, Au, Ag,
Cu, Pb
Mgr: J P Jackson
FLOT-MILL
(See Wash)

**BONANZA OIL & MINE
CORP**
BONANZA MINE, Sutherland,
undergr, Hg
Supt: Burt Avery
Prod: 50 tons
50-TON ROTARY FURNACE
MILL

BRISTOL SILICA CO
Box 437, Rogue River
Pres: Fayette J Bristol
BRISTOL MINE, 5 mi E of
Rogue River, surface, silica
Mine & Mill Supt: Holland Jones
Cons Eng: A O Bartell
Prod: 100 tons
100-TON MILL, Rogue River

CHEM LIME CO
Jackson Towers, Portland
Plant Mgr: Hans Leuenberger
QUARRY, 10 mi W of Baker,
Lime
KILN, Wingville

EICKEMEYER BROS
Fest
MAURY MT MINE, Creek
County, Hg

ESLINGER, RAYMOND
557 Baseline St, Hillsboro
MINE, Glass Butte, Lake County,
Hg

GRABNER, KENNETH
2310 Second St, Baker
RECORD GOLD MINE, Baker,
undergr, Au
Idle

**GREAT LAKES CARBON
CORP, MNG & MFG
PROD DIV DICALITE
DEPT**

Terrebonne
PLANT NO 2 & Mill, 7 mi W
Terrebonne, surface, distonite
Mill Supt: E W West
Plant Chem: O P Johnston
(See Calif, Colo, Nev, N Mex)

HANNA MNG CO
P O Box 85, Riddle
NICKEL MTN MINE, surface,
Ni
Gen Mgr: E S Mollard
Mine Supt: E J Maney
Mine Fm: H J Servant
Mine Eng: W A Foster
Prod: 6,000 tons
(See Mich, Ohio)

**HANNA NICKEL
SMELTING CO (SUBSID
HANNA MNG CO)**
Box 88, Riddle
Gen Mgr: E S Mollard
ELEC MELT PLANT
Pi Mgr: E E Coleman
Supt: L E Rosser
Prod: 18,000,000 lbs nickel
yearly
(See Ohio)

HARVEY ALUMINUM CO
Torrance, Calif
MINE, Salem Hills area,
Marion County, Ferruginous
bauxite
Explor
(See Calif)

HI-POTENTIAL MINES
34 S River Rd, Cottage Grove
Own: Ray E Nelson
VESUVIUS MINE, undergr, Au,
Ag, Cu, Pb, Zn, Mn
Under devel
5-TON GRAV MILL, Bohemia
Assayer: Abbott Hanks Inc
PICKETTS CHARGE MINE,
undergr, Au
Under devel

KINGSLEY MINE
Box 41, Canyon City
Pres: Glenn Findlay
VP: Bandy Sinyar
KINGSLEY MINE, undergr,
Cr-O₃
Idle

KINSELLA & LAMBRETH
John Day
Part: Jim Kinsella, David
Lambreth

**LAST CHANCE MINE, Grant
County, undergr, Cr**
Mine Supt: Jim Kinsella
Mine Fm: Dave Lambeth
Idle
GRAV MILL, Dog Creek, Grant
County
(See Idaho)

KUBLI, CHESTER C
Rt 1, Box 689, Jacksonville
STEAMBOAT MINE, Jackson
County, Upper Applegate dist,
Au, Ag

LAKEVIEW MNG CO
Box 1231, Lakeview
Pres: Dr Garth W Thornburg
VP: Valere Thornburg
Sec: T R Cinn
Purch Agt: T J Wand
WHITE KING & LUCKY LAKE
MINES, 16 mi NW of Lakeview
on Auger Creek, undergr, U₃O₈
Gen Mgr: James F Paulos
Asst Gen Mgr: Howard B Dutro
Geol: Philip S Wein, Richard
Daniels
Mine Supt: Carroll Flick
MILL, Lakeview
Supt: Oliver Hower
Asst Mill Supt: John Vecchie
Prod: 210 tons per day

MINERAL KING MINE
34 S River Rd, Cottage Grove
Own: Harry Williams, Ray
Nelson
MINE, Bohemia dist, undergr,
Cu, Au
Under devel

South Dakota

MONETA PORCUPINE MINES, LTD.
Toronto, Canada
ELKHED MINE, near Tonawanda,
undergr, Hg

OLSSON, HAROLD & PRINGLE, E W
Raman, Montana
GLASS BUTTE MINE, Lake
County, Hg
Under devel

ORR ENGINEERING & CHEM CO
1345 NW Jefferson St,
Portland
MINE & MILL, Columbia
County, Hg
Idle

SOLAR-X CORP
8045 Ustick Rd, Boise,
Idaho
MINE, Pike Cr area, Harney
County, U₃O₈
Explor
(See Idaho)

STANDARD MINES, INC
c/o Ray E Summers
Prairie City
STANDARD MINE, 1 mi from
Prairie City, Grant County,
Au, Ag, Cu
50-TON FLOT MILL

SUNBURST INC
1975 N W Everett St,
Portland 3
Chmn of Bd:
Walter H Schwedler
Pres: James C Young
Sec-Treas: Kay Critchlow
Gen Mgr of all properties:
J C Young, Kay Critchlow
(See Nev, Utah)

TIMBER BEAST MNG CO
Prosser
MINE, Steens Mt area, Harney
County, U₃O₈
Explor

UNITED PACIFIC MNG CORP
3075 Williamette St, Eugene
Pres: Roy C Barr
VP: M L Gans
Sec: Ken White
Treas: Warren C Glawde
SILVER THREAD MINE, 23 mi
E of Jordan Valley, undergr,
Ag, Au, Cu
Mine Engr: G B McLeod
Under devel
50-TON FLOT MILL, Flint
diat, Ag

WENDENHOFF MNG CO
1005 1/2 S 11th St, Tacoma,
Wash
MOTHER LODGE, Crook County,
Hg
(See Wash)

WESTERN MINERALS CO
118 N 8th, Lakeview
Gen Mgr: Paul Parker
MINE, surface, Hg
30-TON ROTARY FURNACE

WESTERN MINERALS INC
Box 697, Lakeview
FOUR SQUARE GRP, Lake
County, Hg

WINTER CREEK MNG CO
800 W Point Rd, Oswego
WINTER CREEK MINE, Crook
County, Hg
Idle

PENNSYLVANIA

ALAN WOOD STEEL CO
Conshohocken
Pres: H R Wood
VP Oper: W E Boger
VP, Marketing: P L Francis
Sec: W B Cashmore
Treas: W M Webb
Purch Agt: C L Bishop
(See N J)

ALUMINUM CO OF AMERICA, MINING DIV
1801 Alcoa Bldg, Pittsburgh 19
Pres: F L Magee
VP: L Litchfield, Jr

Soc: Alfred M Hunt
Treas: E B Wilber
Purch Agt: Ralph Koefer
Gen Mgr in Ch Raw Mat Div:
G W Streepoy
(See Ark, Ill, Ky)

AMERICAN METAL CLIMAX, INC, CLIMAX MOLYBDENUM CO DIV
Langlois
(See Colo, N Y)

BESTWALL GYPSUM CO
130 E Lancaster Ave,
Arizona
Pres: Newton G Lizaas
Exec VP: Malcolm Meyer
Soc: Arthur D Graves
VP & Treas & Compt:
J R Johnston
Purch Agt: J I Trolley
Asst Sec & Treas:
J L Strickland
(See Iowa, Kans, N Y, Tex,
Utah)

BETHLEHEM CORNWALL CORP
70 E Third St, Bethlehem
Pres: A F Petersen
Mgr: S J Shale
CORNWALL MINE, Cornwall,
undergr, Fe, Cu, Au, Ag, S
8,000-TON MAG
CONCENTRATOR
2,500-TON FLOT PLANT
1,600-TON SINTERING PLANT
GRACE MINE, Morgantown,
undergr, Fe
MAG CONC, FLOT PLANT,
pelletizing plant

CERTAIN-THEED PRODUCTS CORP
130 E Lancaster Ave,
Arizona
MINE, Grand Rapids, Mich,
Gypsum, undergr, open pit
(See Mich)

FOOTE MINERAL CO
18 W Chelten Ave,
Philadelphia 44
Pres: L G Bliss
VP: F B Bay
Sec: W R Spofford
Treas: J S Gates
Purch Agt: W M Raynor
Gen Prod Mgr: W B Towner
(See N H, N C, Tenn, Va)

GRAPHITE CORP OF AMERICA
Chester Springs
MINE, Graphite, open pit
Under devel

INTERNAT'L SALT CO, INC
Drawer 511, Scranton
Pres: Edward L Fuller
VP: H J Osborn, John L Ryan,
Mortimer B Fuller, Jr
Edson K Green, Myron L
Hyman
Sec: H J Osborn
Treas: M B Fuller, Jr
(See La, Mich, N Y)

JONES & LAUGHLIN STEEL CORP
1 Gateway Center, Pittsburgh 30
Chmn of Bd-Pres: H C Adams
VP, Prod: A T Lawson
Gen Mgr: Ore Mines & Quarries:
C C Henning
VP & Sec: D F Jones, 3rd
VP & Treas: H H Wunderlick
VP, Purchases: J W Lindsey
(See Mich, Minn, N Y)

KEYSTONE FILLER & MFG CO
501 Railroad St, Muncy
Pres: Charles Pfeeger
MINE, open pit, "rottenstone"

MOLYBDENUM CORP OF AMERICA
Washington
Wks Mgr: Eugene F Lucas
Plant, Washington, Mo, WO₃
PLANT, York, Mo, WO₃, rare
earths
Mgr: W F Allen
(See Calif, Colo, N Mex, N Y)

NEW JERSEY ZINC CO
R D 81, Center Valley
MINE, Friedensburg, undergr,
Zn
Supt: S S Hayett
FLOT MILL
(See Colo, Ill, N J, N Mex,
N Y, Tenn, Va, Wis)

PRINCE MANUFACTURING CO
Barnmansstown,
MINE, undergr, mineral
pigment

ST JOSEPH LEAD CO
150 Park Ave, New York 17,
New York
SMELTER, Josephown
Mgr: John G Wehn
(See Mo, N Y)

SNYDER MINING CO
812 Oliver Bldg, Pittsburgh
Pres: W F Snyder, Jr
VP & Gen Mgr:
Fayette Brown, Jr
Sec: W Laird Davis
Treas: J K Foster
(See Minn)

SUMMIT MNG CORP
Shoreline Bldg, Carlisle
Pres: George Ahl
MINE, Biglerville, open pit,
sericite
Mng Engr: Peter Bannetta
MILL, Aspers

U S STEEL CORP
925 William Penn Place,
Pittsburgh 30
(See Alaska, Ala, Calif, Minn,
Tenn, Utah, Wyo)

SOUTH CAROLINA

COMMERCIALES, INC
Box 98, Clover
VP: H S Doty
Sec: E A Jacobus
Purch Agt: H L Wright
HENRY KNOB MINE, 4 mi W
of Clover, surface, kyanite,
pyrite
Gen Supt: John Strohl
Mine Supt: Leonard Hardin
500-TON FLOT MILL, at mine
Mill Supt: Richard Lachmund
Asst Mill Supt: John McGill

INDUSTRIAL MINERALS INC
York
Pres & Gen Mgr: L O Wilson
VP & Sec: W F Wilson
KINGS CR MINE, 14 mi W of
York, surface, barite,
sericite, open pit
Mine Frm: W M Westmoreland
Prod: 15 tons
KINGS CR MILL, 45-ton, crush
& grind

MINERAL MNG CORP
Lancaster
MINE, undergr, sericite mica
Supt: Frederick Bingham

PACO PRODUCTS INC
Pacostat
FLOT-MILL, Spartanburg
County, Feldspar, silica, mica

SOUTH DAKOTA

A B W MINERALS
Custer
MINE, pegmatites

A & V MINING CO
Custer
MINE, Custer County,
pegmatites

ABINGDON POTTERIES INC
Abingdon, Ill
WHITE ELEPHANT MINE,
Custer County, pegmatites

ALBRIGHT, F J & FRANK
Edgemont
GREENACRES 3 & 4 MINES,
1 mi N of Edgemont, U₃O₈

AMERICAN COLLOID CO
8100 Safford Court,
Buckle, Illinois
BELLE MINE, Belle Fourche,

surface, bentonite
Mgr: Claude Accord
Prod: 600 tons
(See Ill, Miss, Wyo)

BALD MOUNTAIN MNG CO
Trojan
Pres: O D Collie
Treas: Ward Reidesel
Asst Treas: Mildred Stevens
Gen Mgr: P A Miller
Asst Gen Mgr: F Zupet
Elec Eng: W L Hendrickson
Shop Frm: M Wood
Constr, Frm: F Teigen
PORTLAND, CLINTON,
DAKOTA, DECORAH, MNES,
Trojan, undergr, open pit, Au,
Ag
Mine Supt: J Lauritzen
Mine Frm: H Brown, J Giachetto,
J Marsh, E Eckhart
350-TON CYANIDE MILL, Trojan
Au, Ag
Mill Supt: B Olson
Assay: Lloyd Lewis
(See Iowa)

BARCO MINERALS INC
Box 432, Sturgis
Pres: Richard B Williams
VP: M H Braden
Sec-Treas: Ruth I Williams
SPOOKY JOE MINE,
open pit, U₃O₈, V₂O₅
Gen Supt: M H Braden
Geol: W J Lang, Fred R
Williams
Mine Engr: Don Braden
Prod: 10 tons

BETTENHAUSEN, RAY
Box 1031, Edgemont
MINE, U₃O₈

BLACK FOOT COPPER CO
Edgemont
Pres: H L Bieber
MINE, Pennington County,
pegmatites

BLACK HILLS KEYSTONE CORP
Keystone
Pres: W K Wallace
BROOKSOLL MINE, 3 mi NW
Keystone, undergr, open pit,
pegmatite minerals, lepidolite,
mica, tantalite, feldspar, beryl
Supt: Clifford Kiborn
50-TON FLOT MILL
Mgr: A I Johnson

BLACK MAX INC
c/o Elmon Roy, Custer
BOB WHITE MINE, Custer
County, pegmatites

BLAND, GEORGE
Hill City,
Pegmatite producer

BLUE OX MNG CO
Rapid City
MINE, Pennington County,
pegmatites

CHORD URANIUM CO
Edgemont
BAIRDOW, KING MINES, 13 to
15 mi N of Edgemont, U₃O₈

CONS FELDSPAR CO
Keystone
Pegmatite producer

CUSTER NON-METALLICS
Custer
Pegmatite producer

GIANT CYCLE CORP
Box 1039, Edgemont
FREEZEOUT MINE, 20 mi
NW of Edgemont, Fall River
County, undergr, U₃O₈
(Lesser operation)
TRIANGLE MINE, 22 mi NW
Edgemont, undergr, U₃O₈
Res Mgr: John Seerling
Ch Eng: L E Lewis
Frm: R H Leber
(See Colo)

HAUPTMANN, I J
Hot Springs
DRIFTWOOD GROUP
(Bits 3 & 5 Cima), 14 mi N of
Edgemont, U₃O₈

HILLS MATERIAL CO
Rapid City
Gypsum products

HOMESTAKE MNG CO
Lead
HOMESTAKE MINE, undergr,
Au
Mgr: Black Hills oper:
James O Harder
Mine Supt: C N Kravig
Asst Mine Supt: W C Campbell
Ch Geol: A L Slaughter
Ch Mech Eng: LeRoy Seybers
Ch Met: C E Schmidt
Ch Elec Eng: C L Gost
Safety Eng: Phil Graves
Purch Agt: F E Bryan
Prod: 4,500 tons
4,500-TON CYAN MILL, at
mine
(See Calif, N Mex, Utah, Wyo)
(Homestake Partners & Home-
stake-Sagin Partners)

INTERNAT'L MINERALS & CHEMICAL CORP
Old Orchard Rd, Buckle, Ill
Western Plains, Gen Supt:
J W Mitchell, Keystone
MINES, Custer, open pit,
feldspar
200-TON MILL, Custer, dry
grinding
Plant Supt: R H Brigham
Mine Supt: A E Boone
Mine Frm: Felix VanOverbeek
MINE, Keystone, open pit,
feldspar
75-TON MILL, Keystone
Mine Supt: A E Boone
Mine Frm: Irvin Givens
(See Ark, Colo, Fla, Ill, Maine,
Miss, N Mex, N C, Tenn, Va,
Wyo)

KEYSTONE FELDSPAR & CHEM CO
Keystone
Mgr: Thomas Edsen
Pegmatite producer
(See Ill)

PETER LIEN & SONS
Box 1072, Rapid City
Pres: Peter C Lien
VP: Charles H Lien
Sec-Treas: Bruce A Lien
QUARRY & KILN, limestone
Gen Supt: Robert Groethe
Geol: Ray Smith
Mine Supt: Al Johnson
Elec Eng: Elmo More
Prod: 1,000 tons

LITHIUM CORP OF AMERICA INC
2500 Rand Tower,
Minneapolis 2, Minn
Pres: H W Rogers
MINES, near Hill City, undergr,
surface, Li
Gen Mgr: John C Talley, Sr
FLOT-MILL, Hill City
Supt: Carlton B Harris
(See Minn, N C)

LORENZ BROS*
Hot Springs
DAMSITE NO 1, 8 mi NE of
Edgemont, U₃O₈

LUTAN URANIUM & OIL, INC

744 Petroleum Bldg,
Roswell, New Mexico
Pres: Gordon E McMeen
VP: Homer F Glover
Sec-Treas: David J McKee
McLEOD MINE, Edgemont,
open pit, U₃O₈, V₂O₅
Gen Mgr: Harry Engman, Jr
Asst Gen Mgr: Earl Long
Under devel

MIL MNG CO
1006 Farlow Ave,
Rapid City
HEY & FAY 3 & 6, 11 mi N
of Edgemont, U₃O₈

MAYWOOD CHEM WORKS
Hunter Ave, Maywood, N J
ETTA MINE, Keystone,
apocumens
Mgr: Dewey Peterson

MCCARTY - PULLEN MINES
Custer
MINES, Pennington County,
pegmatites

McKENNIE GULCH MNG CORP
Box 480, Sturgis
Pres: E G Brown
VP & Gen Supt: Donald L
Cammack

Sec: J W Kowling
Treas: Andy Wagner
Purch Agt: Tom Wagner
MARIAN MINE, open pit, U₃O₈
Gen Mgr: Andy Wagner
Asst Gen Mgr: Tom Wagner
Under devel

MINERALS MILLS, INC
Custer
Pres: Albert Gushurst
Sec & Gen Mgr: A I Johnson
GLENWOOD MINES, 4 mi NW
of Custer, S.D.
Under devel

MINES DEVELOPMENT, INC
Farmers Union Bldg.
Denver 3, Colo
Pres: J P Lennon
Exec VP & Gen Mgr:
Allen D Gray

Sec-Treas: W H Hoadley
Prod Mgr: George T Bator
Met Cons: H L Hazen
Purch Agt: G T Bator
400-TON ELVEX MILL,
Edgemont, U₃O₈
Mill Supt: H D Webb
Prop Firm: O M McGuire
Plant Eng: G F Richards
(See Colo.)

MONTANA CHEM & MNG CORP
Box 1059, Edgemont
MINE, U₃O₈

NAT'L LEAD CO
BAROLD SALES DIV
Belle Fourche
Local Rep: Dave Rowland
(See Calif, N.Y., Utah)

NORTHWEST DEFENSE MINERALS INC
Spearfish
MINE, Lawrence County,
pegmatites

PICTOGRAPH MNG & URANIUM CO, INC
(Subsidiary of MONTANA CHEM & MNG CORP)
Box 1059, Edgemont
RUNGE MINE, U₃O₈, V₂O₅
Gen Mgr: Gerald C Mathis
Mine Firm: Vernon Martin

ROSEBERRY, CARL
Custer
Pegmatite producer

SCOTT'S ROSE QUARTZ CO
Custer
Mgr: Frank S Scott
RED ROSE & MOUNTAIN ROSE
MINES, nr Custer, pegmatite
minerals

SHELDON-WARREN OIL CO
146 Petroleum Bldg.
Roswell, N Mex
K-9 MINE, 9 mi NE of
Edgemont, U₃O₈

SPRING, KENNETH
Custer
Pegmatite producer

TRIANGLE ENTERPRISES, INC
Edgemont
BUO MINE, 15 mi N of
Edgemont, U₃O₈
(See Giant Cycle Corp)

US GYPSUM CO
Fidmunt
Gypsum products
(See Calif, Colo, Conn, Ill, Ind,
Iowa, Mass, Okla, Utah, Va,
Tex)

URANIUM & ALLIED MINERALS INC
205 Security Bldg, Box 113,
Keystone
DYKE LODGE, HOLY TERROR
MILL MINES, Pegmatites

VICKERS FELDSPAR CORP
Box 93, Keystone
BIG CHIEF, Fremington County,
Pegmatites

WHITE CAP MNG CO
Keystone
Mgr: L R McCarty
Pegmatite producer

YORK MINERALS
Newcastle, Box 547, Wyo
HELEN BERYL, RED DEER
MINES, Custer County,
pegmatites

TENNESSEE

AMER ZINC CO OF TENN
(Subsidiary of Amer Zinc, Lead &
Smelt Co)

Mascot
VP: H A Coy
Mgr: William Black
Gen Supt: M J Langley
Supt: Jefferson County Mines:
Harry L Miller

Supt, Young Mine:
R L Brittain

Supt, Mascot No 3 Mine:
Glenn Hurst

Purch Agt: C C Sisk
Ch Eng: W N Johnson
Ch Geol: C R L Oeder
Supr, Mech-Elec Dept:
Ivan D Campbell

Personnel Dir: J L Allison
Safety Eng: H F Thompson
Ch Mill Supt: D B Grove

Ch Chem: D E Chadwick
Met: J R Fehrmans
MASCOT NO 3 MINE, Mascot,
undergr, Zn Sulphide

YOUNG MINE, South Friends
Station, undergr, Zn Sulphide

NORTH FRIENDS STATION
MINE, North Friends Station,
undergr, Zn Sulphide

GRASSELLI MINE, New Market,
undergr, Zn Sulphide

COY MINE, Jefferson City,
undergr, Zn Sulphide

4500-TON FLOT GRAY MILL,
HMS, Jigs, Mascot
(See Ariz, Mo, Ill, Ohio, Okla,
Tex, Wash, Wis)

ARMOUR FERTILIZER WORKS INC
Columbia
Supt: W B King
PHOSPHATE MINE
(See Fla)

B & T MNG CO
Box 659, Bristol
Part: Harold D & J E Tipton
B & T MINE, Johnson County,
open pit, Ma.

Gen Supt: J R Sluder
Prod: 10 tons

COLUMBIA ROCK PROD CORP
Pressnell Bldg, Columbia
Pres: Wayne Pressnell
VP: Harry Pressnell

Sec-Treas: Wm C Fraser
Asst Sec-Treas: W J Davis
MINE, undergr, limestone

Gen Mgr: Harry Pressnell
Prod: 2,000 tons
2,000-TON MILL, Columbia

CONSOL HIGH GRADE ORE CO
Calhoun
Paris: G S Murray, I D Murray,
J D Murray

MINE, Calhoun, open pit, Ba
Mine Supt: Earl Sludge
Under devel

FELDSPAR CORP, THE MINES, Erwin
FLOT MILL, Erwin, Dry
Grinding

Supt: S T Hughes
Asst Supt: Ford McKinney
(Subsidiary of Pacific Tin Consol
Corp, N.Y.)

(See Ga, Nc & Pacific Tin
Consol, N.Y.)

FOOTE MINERAL CO, ELECTRO MANGANESE DIV
1400 Loraine,
Knoxville 1

Div Acct: Otto Neumann
TWO PLANTS, Knoxville
1323 Proctor Street

1400 Loraine Street
(See N.H., N.C., Pa., Va.)

HARSH PHOSPHATE CO
760 Murfreesboro, Nashville 10
Gen Mgr: M G Marsh

Sec: T L Harsh
MINE, 3 mi SE of Nashville,
surface, ground, phosphate rock
Prod: 125 tons

HIGHLAND MINING CORP
Centerville
Pres & Gen Mgr: Bill Davis
VP: D Brown
Sec: M Brown
HIGHLAND MINE, Centerville,
surface, phosphate rock
Prod: 700 tons

INTERNAT'L MINERALS & CHEMICAL CORP
Old Orchard Rd, Skokie, Ill
CONSOL FELDSPAR DEPT, Erwin

Prod Mgr: Charles Hunter
Asst Prod Mgr: J R LeGrand
Purch Agt: Paul Willis

MICA PLANT, Erwin, dry
grinding

Gen Supt: J R LeGrand
100-TON MICA FLOT PLANT,
Greenville

Gen Supt: Phil Thomas
(See Ariz, Colo, Fla, Ill,
Maine, Miss, N Mex, N.C., S.D.,
Va, Wyo)

MONSANTO CHEM CO
Columbia
MINE, 8 mi SW of Columbia,
surface, dragline excav,
phosphate

Gen Mgr: J L Christian
Asst Gen Mgr: H F Weaver
Purch Agt: E L Sanderlin

Mine Supt: H A Webster
Asst Supt: J W Steenberg
Furnace Supt: R B Shaffner

Mech Eng: W G Allen
Elec Eng: R L Van Fossen
Safety Eng: H E Coker

Prod: 2,000 tons
GRAY MILL
ELEC FURN, 25,000-kw,
yellow phosphorus
(See Idaho, Mo)

NATIONAL LEAD CO, BARITE DIV
Sweetwater
Mine & Mill Supt: J T Keim

MINE, surface, barite
Prod: 70 tons per day
MILL, washing, jigging,
grinding

(See Ariz, Calif, Colo, La, Mo,
Mont, Nev, N.Y., Tex, Wyo)

NEW JERSEY ZINC CO
169 Front St, New York 39,
New York

JEFFERSON CITY MINE,
Jefferson City, undergr

Gen Supt, Tenn Oper:
Johnsen Crawford
Supt: H G Miller

Mine Ch: D H Jolly
Plant Ch: R E Dougherty
MILL

FLAT GAP OPERATION,
Treadway
Supt: J I Craig

Mine Ch: A C Savage
(See Colo, Ill, N.J., N Mex,
N.Y., Pa, Va, Wis)

PRESSNELL PHOSPHATE CO, INC
Pressnell Bldg, Columbia
Pres: Wayne Pressnell

VP: Harry Pressnell,
H R Mosley

Sec-Treas: W J Davis
Asst Sec-Treas: Wm C Fraser

MINE, surface, phosphate
Prod: 1,000 tons
150-TON FLOT MILL, Columbia

RIVER & RAIL PHOSPHATE CO
135 2nd Ave N, Nashville
Pres & Gen Mgr: L H Jordan

Sec: S E Wheeler
Gen Supt: Claude Warren
MINE, 6 mi NW of Nashville,
surface, dragline, raw
phosphates

PLANT, Jordan, Tenn

SOUTHERN MICA CO
Johnson City
Pres & Gen Mgr: C Bailey Rice

VP: Martha R McClain
Sec-Treas: B F McClain
40-TON GRAY MILL, Johnson
City

Mill Supt: J F Reynolds
Mill Firm: Haskell Garland

TENNESSEE COPPER CO
Copperhill
EUREKA, BOYD, CALLOWAY,
MARY MINES, Ducktown, Polk
County, undergr, Sulphuric

acid, Fe, Cu, Zn
Pres: T A Mitchell
Mgr: R R Burns
Gen Supt: L Weaver
Geol: Owen Kingman
Elec Eng: L B Murray
Mine Supt: H F Kendall
Asst Mine Supt: R G Clay
Prod: 110,000 tons per month
10,000-TON FLOT MILL,
Ducktown
Mill Supt: F M Lewis
Asst Mill Supt: James Goodman
REVERB SMELTER, Copperhill
Supt: W Y Querry
Asst Supt: W F Hardin
Output: 20,000,000 lbs Cu yrly

TENNESSEE VALLEY AUTHORITY
Knoxville

KNOX CREEK, Columbia, 3
mi N of Columbia, surface,
phosphate

Gen Mgr: Aubrey J Wagner
Gen Supt: V S Wildamith
Geol: R S Ingle

Mech Eng: Henry T Putz
Safety Eng: Karl W Potts
Mine Supt: Charles A Irwin
Prod: 300 tons

U S STEEL CORP, TENN COAL & IRON DIV
Jefferson City

ZINC MINES WORKS
Gen Supt: R T Wilson

Geol: S K Myatt
MINE, undergr, open pit, Zn
Mine Supt: C E Piper

Mine Firm: H H Kier
Mine Eng: J A Miller
FLOT MILL

Mill Supt: J A Rhoton
(See Alaska, Ala, Calif, Minn,
Pa, Utah, Wyo)

VIRGINIA-CAROLINA CHEM CORP
401 E Main St, Richmond, Va

MINE, Mt Pleasant, open pit,
phosphate rock
Mgr: M D Girardau
(See Fla, Va)

VIRGINIA IRON, COAL & COKE CO
325 W Campbell Ave,
Knoxville

Pres: Samuel T Brown
VP: Samuel T Brown, Jr

Sec-Treas: Joyce C Elmore
STONE CREEK MINE,
Elizabethton, open pit, Mn

Gen Mgr: R J Butler
Mine Supt: Walter Smith
Prod: 10 tons per day
FLOT MILL, Stony Creek

TEXAS

ALUMINUM CO OF AMERICA
1501 Alcoa Bldg, Pittsburgh 19

Pres: Frank L Magee
REFINING & REDUCTION
WORKS, Point Comfort &
Hockley

Oper Mgr: B H Sloane, Point
Comfort

Oper Mgr: A R Sugg, Rockdale

AMERICAN SMELTING & REFINING CO
Box 111, El Paso

Mgr: Ben D Roberts
Asst Mgr: Robt M McGeorge
EL PASO SMELTING WORKS,
2 mi N of El Paso, Pb, Cu

smelting & converting, Zn fuming
Supt: T J Woodside

Pl Eng: J W English
Supply Agt: R E Redman
(See Ariz, Calif, Colo, Idaho,
Ill, Md, Mont, Neb, N.J., N Mex,
N.Y., Utah, Wash & Fed Mng &
Smelting Co, Mo)

AMERICAN SULPHUR ROYALTY CO
Cherokee Bldg, Houston

MINE, Humble Dome, Harris
County, Sulphur

AMER ZINC CO OF ILLINOIS (Subsidiary of AMER
ZINC, LEAD & SMELT CO)
Box 577, Dumas

RETORET SMELTER, Dumas
Mgr: W E R Smith
Supt: G R Bailey

Pl Eng: C R Griffin
Purch Agt: W G Hollifield
Office Mgr: J C Kersten
Output: 100,000,000 lbs Zn
yearly
(See Ariz, Ill, Mo, Ohio, Okla,
Tenn, Wash, Wis)

ARMCO STEEL CO SHEFFIELD DIV
Box 3128, Houston

MINES, Morris County, Pa
PLANT, Houston

ATKINS, ROY T & LUTON, D T
2308 Donaldis St, Fort Worth
MINE, U₃O₈

BESTWALL GYPSUM CO
120 E Lancaster Ave,
Ardmore, Pa

MINE, Hardeman County;
Gypsum
(See Iowa, Kans, N.Y., Pa,
Utah)

CAPITAL-SEABOARD CORP
900 Oil & Gas Bldg,
Wichita Falls

Pres: Joseph H Corbin
VP: Ray A Bennett (Mng)
VP: F H Corbin (Oil)

Sec: William A Pope, Jr
Treas: Howard L Corbin
Purch Agt: Gil Maxwell
(See Ariz, Idaho, Mont, N Mex,
Utah)

CASHER GYPSUM CO, INC
3247 Louisville St, El Paso

MINE, Hudspeth County, gypsum

THE CELOTEX CORP, HAMLIN DIV
120 S LaSalle St,
Chicago, Ill

MINE, Longworth, Fisher
County, gypsum
(See Ill)

CHRISTIAN & SONS
c/o Henry Christian,
Gonzales

MINE, Hudspeth County, talc,
asbestos

DUVAL SULPHUR & POTASH CO
17th Fir Mallie Esperson
Bldg, Houston 2

Pres: W P Morris
VP & Treas: Eugene Gorman
Sec: V J Thornhill

ORCHARD MINE, 2 mi SE of
Orchard, sulphur
Acting Res Mgr: X T Stoddard
(See N Mex, Ariz)

FLINTKOTE CO, THE
Sweetwater
MINE, Sweetwater, Nolan
County, gypsum
(See Ariz, Calif, Nev)

FREESPORT SULPHUR CO
181 E 42nd St, New York 17,
New York

MINE, Nash Dome, Sulphur
(See La, N Mex, N.Y.)

GARZA MNG CO
Box 171, Fort Worth
MINE, open pit, U₃O₈

Mine Supt: C L Brownlow
Under devel

GIBRALTAR MINERALS CO
Plainview

Pres: H Hinim
HORNET & AMERICAN MINES,
4 mi W Hachita, N.M., undergr,
Pb, Zn, Ag

Gen Mgr: Leo Jordan
Mine Firm: Charles Gardner
85-TON GRAY MILL, at mine
(See N Mex)

GLENN-REY CORP
Chatsworth, Ga
Mgr: Francis T Glenn

MINE, Hudspeth County, talc,
asbestos
(See Ga)

JEFFERSON LAKE SULPHUR CO
1408 Whitney Bldg,
New Orleans 12, La

Pres: Eugene H. Walet, Jr.
VP, Frasch Sulphur Plants:
Harvey A Wilson
Chas J Ferry

Treas & VP: L L Lassalle

Purch Agt: Carl McElrath
CLEMENS DOME, BRASORIA
LONG POINT DOME, Fort
Bend County
 Gen Mgr: Harvey A Wilson
 Asst Gen Mgr: L V Lebeuf
 Gen Supt: L B Jensen
 Geol: C D Blanche
 Mech Eng: T R Trahan
 Mill E: Warren
 Elec Eng: Oliver Romero
 Asst VP: H J Grace
 Prod: 1300 long tons per day
 (See La)

LOWE STAR MNG CO
 3600 Conway, Fort Worth
 MINE, Hudspeth County, Ng
 Under devel

LOWE STAR STEEL CO
 Box 12326, Dallas
 Pres: E B Germany
 Exec VP: W H Johnson
 VP Oper: L O Grapner
 VP Sales: W T Moreland
 VP Pub Rel & Adv:
 L D Webster
 VP Purch & Sec: J M Morris
 VP Cont & Asst Treas:
 Max Dodson
 Works Mgr: J M Bruchner
 Coke & Iron Supt: S G Anderson
COKE & IRON DIVISION
 Ore Div Supt: A B Dreecher
 Mng Asst Supt: V F Malone
 Benef Asst Supt: V Camp
 Gen Mng Fm: R T Dudley
 Gen Supt Fm: I J Bassett
SERVICES
 Indus Rel Dir: P C Russell
 Ch Elec Engr: J N Harper
 Ch Indus Engr: W L Smith
 Safety Dir: R S Beasley
LOWE STAR MINES, BLACK
MT, HUGHES SPRINGS,
ROGERS, KING & OTHERS
 12, 000-TON GRAY MILL,
 Calcining & sintering
 BLAST FURNACE
 Cap: 1,500 tons daily

MAGNET COVE BARIUM
CORP
 Box 8504, Houston 5
 MINE, Zassala, open pit, clay
 Div Mgr: C L Wilkinson, Jr
 Plant Mgr: A T Donovan
 250-TON MILL, dry grinding
 Mill Fm: Robert Chambers
BARITE GRINDING PLANT
 Brownsville
 (See Ark, Fla, Mo, Nev, Wyo)

MORTON SALT CO
 120 So LaSalle, Chicago 3, Ill
 MINE, Grand Saline, salt
 Mgr: Reid Lesser
 Asst Mgr: J L Sellers
 Prod: 800 tons
 (See Ill, Kans, La, Ohio)

NASH MINES
 408 Nash Bldg, Austin
 Own: Jas P Nash
 (See Ariz)

NATIONAL GYPSUM CO
 325 Delaware Ave, Buffalo 2,
 New York
 MINE, Fisher County, 1 mi N of
 Rosam
 PLANT, 1 mi S of Rosam
 (See N Y)

NATIONAL LEAD CO.
BAROID DIV
 Box 1078, Houston
 Gen Mgr: G B Coale
 Asst Gen Mgr: J W Hofstetter
 Asst to Gen Mgr:
 E J Hagstette, Jr
 H N Farnham
 Prod Mgr: Reginald Rowand
CORPUS CHRISTI PLANT,
 barite, dry grinding mill
 Mill Supt: T A Studer
HOUSTON PLANT, bentonite,
 barite, dry grinding mill, oil
 well chem
 Supt: R J Penrose
MULDON MINE, Muldon
 bentonite, surface
 Supt: R J Penrose
TEXARKANA PLANT, Texas-
hama, oil well chem, dry
 grinding
 (See Ark, Calif, Colo, La, Mo,
 Mont, N Y, Tenn, Wyo)

NATIONAL LEAD CO.
TEXAS MINING &
SMELTING DIV
 Box 588, Laredo
 Mgr: J C Archibald Jr

Ch Chem: Fidel Gonzalez
 Comp: Claude Noton
REVERS & BLAST FURNACES,
FUMING PLANT, Highway 81,
N Laredo
 Plant Supt: R L Kulpaca
 (See Ark, Calif, Kans, La, Mo,
 Mont, Nev, N Y, Tenn, Wyo)

PALANGANA CORP
 (Subsidi of Union Carbide &
 Columbia Southern)
 MINE, Duval County, uranite,
 pyrite
 Exploir

PELTON, CLYDE V
 P O Box 421, Carlsbad, N Mex
 MINE, Hudspeth Co, talc,
 soapstone
 (See N Mex)

PHELPS DODGE
REFINING CORP (Subsidi of
 PHELPS DODGE CORP)
 Box 1372, El Paso
ELEC COPPER REFINERY,
COPPER SULPHATE PLANT,
 also NBO, Se, Te
 Works Mgr: E W Donahue
 Asst Works Mgr: B B Kunkle
 Prod: 576, 000, 000 refined cu
 yearly
 (See Ariz, N Mex, N Y)

RADIATION EXPLOR CO,
INC
 Box 151, Henrietta
 Pres: C L Brownlow
 VP: James W Heath
 Sec: Paul Eggers
TWIN BATTLES & CROWN
MINES, Pease, open pit, U₃O₈
 Gen Mgr: C L Brownlow

RARE METALS CORP OF
AMERICA
 1st Security Bldg,
 Salt Lake City 11, Utah
 Affiliate of EL PASO NATURAL
 GAS CO, Texas St at Stanton,
 Box 1492, El Paso
 Pres: C L Perkins
 VP & Asst Gen Mgr:
 M H Kline
 (See Ariz, Idaho, N Mex, Utah)

REYNOLDS METALS CO
 Reynolds Metals Bldg,
 Richmond, Va
REFINERY & REDUCTION
WORKS, Gregory
 (See Va)

SOUTHWESTERN
GRAPHITE CO
 Burns
 Pres: George W Clemons
 VP: Robert P Miller, Jr
 VP & Gen Mgr: R P Miller, Jr
 Sec-Treas: Robert P Miller, Jr
 Supt: G E Hilliard
 Geol: D C Peacock
 Elec Eng: Geo Lockwood
 MINE, 11 mi NW of Burns,
 surface graphite
 Mine Fm: Eric Bible
 Prod: 100 tons
250-TON FLOT MILL, at mine
 Mill Fm: Tom McAllister
 Assay: James Wright

SOUTHWESTERN TALC
CORP
 Box 582, Llano
 Pres: Wm Negley
 VP & Sec: Clinton G Brown, Jr
 VP & Treas: Fred C Groce
 Asst Sec & Office Mgr:
 Tracy Ward
 MINE, Sierra Blanca, open pit,
 commercial talc
 Gen Mgr: J H Upton (Van Horn,
 Tex)

SUNRISE MNG CO
 Simons Bldg, Dallas 1
 Pres: A P Simons
 VP: William C Lacy,
 T K Shonaker
 Sec-Treas: Roy R McKee
 (See Ariz)

TEXAS BARITE CO LTD
 300 Harrington St, Houston
 GRINDING PLANTS, Harris,
 Maverick Counties

TEXAS GULF SULPHUR
CO
 New Gulf
HOLDING DOME, New Gulf,
 sulphur
MOSS BLUFF, Liberty, sulphur
SPINDLETOP MINE, Beaumont,
 sulphur
VANHETT MINE, sulphur
 undergr
 Gen Mgr: H W Strickland
 Asst Gen Mgr: C L Orr &
 A F Zemanek
 Prod: 9000 long tons per day
 (See N Y)

TEXAS TALC CO
 7834 2nd Ave, Dallas
 ROSSMAN MINE, Hudspeth
 County, talc

TWIN STAR INDUSTRIES,
INC
 1111 S Congress T, Austin
 Pres: W B Pratt
 Exec VP & Treas: Leigh Kline, Jr
 VP, Mining: John S McNeill, Jr
 VP, Sales: Warren Beaman

U S GYPSUM CO
 300 W Adams St, Chicago,
 MINE, Sweetwater, Nolan County,
 open pit, gypsum
 Works Mgr: T N Kaesner
 (See Calif, Colo, Conn, Ill, Ind,
 Iowa, Mass, Okla, S D, Tex,
 Utah, Va)

WAH CHANG CORP
 123 Broadway, New York, N Y
TIN SMELTER, Texas City,
 (See Calif, Colo, N Y)

WESTER TALC CORP OF
HOUSTON
 Alamoore
 MINE, Hudspeth County, open
 pit, talc
 Under devel

UTAH

A B & H MNG CO
 c/o T Albrecht, Dicknell
 MINE, U₃O₈

ADAIR, IVOR
 Box 382, Moab
 MINE, U₃O₈

ALAMCO INCORP
 620 Kennerly Bldg,
 Canton, Ohio
 MINE, in Utah, U₃O₈

ALBRECHT, SHERWOOD
 Dicknell
 MINE, U₃O₈

ALTAMONT MNG &
URANIUM INC
 50 E 10th S, Bountiful
 Pres: George M Schlutz
 VP: Thomas R Reuss
 Sec-Treas: Leo L Ralph
 MINE, Osmussen, Colo, U₃O₈
 MINE, Medora, Nev, As
 Gen Mgr: George M Schlutz
 Const-Mine Fm:
 Robert H Y Dunsmuir
 Under devel
 (See Colo, Nev)

AMERICAN BLOCK CO
 1618 S Industrial Rd,
 Salt Lake City
 MINE, Fe

AMERICAN GILSONITE
CO
 134 West Broadway,
 Salt Lake City
 Pres: E F Goodner
 VP-Prod Mgr: R E Nelson
 Sec-Treas: E H Owen
BONANZA MINES, Bonanza,
 undergr, gilsonite
 Mine Supt: Paul Borden
 Mine Fm: L F Williams
 Maint Fm: Nathan Jones
 Prod: 800 tons
200-TON MILL, Bonanza,
 drying & sizing plant
 (See Colo)

AMERICAN SMELT &
REFIN CO
 700 Crandall Bldg,
 Salt Lake City 1
WESTERN DEPARTMENT

Gen Mgr: W G Rouillard
MINDING DEPT
 Mgr: J F Frost
 Office Mgr: L K Nicholson, Jr
 Senior Geol: W P Hewitt
 Mill Eng: Norman Weiss
 (See Ariz, Calif, Colo, Idaho,
 Ill, Md, Mont, Neb, N J, N Mex,
 N Y, Tex, Wash & Federal Mng
 & Smelting Co, Mo)

AMERICAN STAR MNG CO
 608 Dooly Bldg, Salt Lake City
 Pres: Cecil Fitch
 VP: Cecil Fitch, Jr
 Sec-Treas: W W Watson
AMERICAN STAR MINE,
 Eureka, Ag, Au, Cu, Pb
 Mde

AMERICAN ZINC, LEAD
& SMELTING CO
 1800 Paul Brown Bldg,
 St Louis 1, Mo
 Western Geol: Hiram P Mills
 2062 E 3135 South, Salt Lake
 City
 (See Ill, Miss, Okla, Tenn, Tex,
 Utah, Wash)

AMPET CORP
 523 Colorado Bldg, Denver 3
 Pres: R A Gus Davis
 Sec-Treas: A O Brubaker
VANADIUM KING I & S, Temple
Mt, Emery County, undergr,
 U₃O₈, V₂O₅
 Gen Mgr: R A Davis
 Mine Supt: Jay Gillies
 MILL, Green River
 (See Ariz, Colo)

ANSCHUTZ DRILLING CO
INC
 1411 Mile High Center Bldg,
 Denver, Colo
JIMBO BOB MINE, 20 mi NE of
Monticello, undergr, U₃O₈
 Geol: Fred C Holten
 Mine Supt: K A Hollen
 Prod: 20 tons per day
 (See Colo, Wyo)

ARENZ COMSTOCK MNG
VENTURE
 870 First Security Bldg,
 Salt Lake City
 Pres: Samuel S Arenz
 (Managing Partner)
 Treas: Frank H Anderson

ARIZUTC DEVEL CO
 Lea
 MINE, U₃O₈

ASTRO MINES INC
 Provo
 MINE, U₃O₈

ATKINSON EXPLOR CO
 2501 Liberty Bank Bldg,
 Oklahoma City, Okla
 MINE, in Utah, U₃O₈

BADE MNG CO
 c/o Bert J Johnson,
 2730 Eldridge St, Golden,
 Colorado
 MINE, U₃O₈

BALSLEY, TOM
 P O Box 821, Moab
 MINE, U₃O₈

BARBER MNG CO
 P O Box 831, Monticello
 MINE, U₃O₈

BARROS, RICHARD
 Box 504, Sunnyside
SILVER SPUR I, Emery County,
 open pit, Au, Cu
 Mde

BEAR CREEK MINING
CO
 161 42nd St, New York 17,
 N Y
 MINE, East Titanic dist, Au,
 Ag, Cu, Pb, Zn
 Under devel
 (See Ariz, N Y & Kennecott
 Copper Corp, N Y)

BEATTY, HELENE E
 Box 5235, E Pasadena Station,
 Pasadena 8, Calif
MONTA ROSE MINE, Fe

BENSON, CHARLES A
 935-1-2 Main St,
 Grand Junction, Colo
 MINE, U₃O₈

BENSON & POST
 Grand Junction, Colo
 MINE, U₃O₈

BESTWALL GYPSUM CO
 130 E Lancaster Ave,
 Ardmore, Pa
GYPSUM MINE, Sigurd
 (See Iowa, Kans, N Y, Pa, Tex)

BIG HORN URANIUM
CORP
 c/o Keith B Redd, Monticello
 Pres: Allan Egbert
 VP: Morris Nelson
 Sec-Treas: Frank Hammond
 Gen Mgr: Keith B Redd
LOST BOY MINE, White
 Canyon dist, undergr, U₃O₈
 Mine Fm: Max Egeal
 Mde

BIG REEF URANIUM CO
 914 Deere Bldg,
 Salt Lake City
 MINE, U₃O₈

BINGHAM EMPIRE MNG
CO
 235 S 5th East,
 Salt Lake City 3
 VP: Philip S Knight
 Sec-Treas-Gen Mgr:
 Richard Knight
BINGHAM EMPIRE MNG CO
MINE, Bingham Canyon,
 undergr, Cu
 Mde

BLACK BEAR CONS MNG
CO
 188 N Canon Dr,
 Beverly Hills, Calif
 Pres: Ralph S Reiner
 Utah Agent: Merrill C Faux
 MINE, Poita Fraction,
 Durkee dist, Plate County,
 U₃O₈
 Mde

BLACK, CECIL
 P O Box 1013, Monticello
 MINE, U₃O₈

BLEAK, FRED
 Flaming
 MINE, U₃O₈

BLUE CREEK MNG CO
 P O Box 1849, Grand
 Junction, Colorado
 Part D G Son, Jr Munro,
 E L Hess
BLACK HAT URANIUM MINE,
 Paradox dist, U₃O₈
 Under devel

BOLLES, EDGAR & JOHN
 1030 N 6th St,
 Grand Junction
 MINE, U₃O₈

BONNEVILLE, LTD
 540 W 7th South St,
 Salt Lake City 4
 Chmn of Bd: W L Bradley
 Pres: L W Ferris
 Sec: G B C Mathison
 Treas: Robert Livermore
 Purch Agt: W R Thomas
 MINE, Wendover, KC1
1,000-TON FLOT MILL
 Gen Mgr: L W Ferris
 Gen Supt: Jesse V Ecton
 Asst Supt & Mill Fm:
 J Rande Wiley
 Met: D C Hunter
 Chemist: Clyde Andrew,
 Hal C Ballard

BOYLES BROS DRILLING
CO
 1321 S Main St,
 Salt Lake City
 Pres: R T Goldsworthy
 VP: H L Baker
 Sec: A F Goldsworthy
 Treas: V L Stevens
 Purch Agt: A P Tackler
 Comptroller: E D Hadson

BRISTOL SILVER MINES
CO
 218 Felt Bldg,
 Salt Lake City 11
 Pres: George W Snyder
 VP: J H Buchler
 Sec-Treas: C M Christensen
 Purch Agt: Hoyt Adair
 (See Nev)

BULLION MONARCH MNG CO

Idaho Falls, Idaho
Or c/o VANADIUM CORP OF AMERICA, 430 Lexington, New York 17, New York
FARMER JOHN MINE, Marysville dist, Platte County, U₃O₈
(Leased to VCA)

C & B MINES

Box 38, Uravan, Colo
MINE, in Utah, U₃O₈

C & W BLACK MNG CO

Monticello
MINE, U₃O₈

CALERA MNG CO

(SUBSID OF HOWE SOUND CO)

P.O. Box 487, Magna

Pres: W M Weaver

(Howe Sound Co)

VP: W T Holmes

F A McGonigle (Howe Sound Co)

Treas: J T Willmott (Howe Sound Co)

Purch Agt: J C Farnsworth (Calera Mng)

REFINERY, Electrolytic, Reduction System, Garfield Plant Supt: H L Richards

(See Idaho, Howe Sound Co, N Y)

CAPITAL-SEABOARD CORP

Box 1847, Farmington, N Mex

Pres: Joseph H Corbin

Exec VP & Gen Mgr:

Chas W Vetter

Sec: Wm A Pope, Jr

Treas: Howard L Corbin

TAYLOR REID #1, 2, Ojato

San Juan County, undergr.

U₃O₈, V₂O₅

Mine Supt: James Donmini

Prod: 15 tons

(See Ariz, Idaho, Mont, N Mex, Tex)

C&D MNG & MFG CO

Box 5008, Denver 18, Colo

Pres-Gen Mgr: M S Stone

VP-Treas: H S Dickson

Purch Agt: Matt Martinson

CARDIFF MINE, Salt Lake

County, undergr, Ag, Pb, Zn

Geol: G L Fairchild

CARISA MINING CO

P.O. Box 107, Marysville

CARISA MINE, undergr, Au,

Ag, Pb, Cu

Own: Lucy Deluke

Under devel

CARLISLE URANIUM CO

c/o Curtis Jones, Blanding

MINE, U₃O₈

CENTENNIAL DEVEL CO

Eureka

Pres: Harold B Spencer

VP: James Quigley

Sec-Treas: Robert E Watt

Otc Mgr: Frank McCabe

Fid Eng: E Steele McIntyre

CHIEF CONSOL MNG CO

608 Dooly Bldg,

Salt Lake City

Pres & Gen Mgr: Cecil Fitch, Jr

VP & Sec-Treas: W W Watson

CHIEF NO 1, Eureka,

undergr, Zn, Pb, Ag, Au

Idle

CLIFF DEVEL & EXPLOR CORP

4643 Hyland Dr,

Salt Lake City

Pres & Gen Mgr: W C Dunham

VP: Deloy Tanner

Sec-Treas: Doris T Dunham

SHOWERS MINE, Silver City,

undergr, Cu, Pb, Zn

RUSH VALLEY, Vernon,

undergr

Geol: W C Dunham

CLIMAX URANIUM CO

(Subsid of AMERICAN METAL CLIMAX)

P.O. Box 1801,

Grand Junction, Colo

Pres: Frank Coolbaugh

VP-Gen Mgr: A M Mastrevich

Consultant: E J Duggan

Mgr of Mines: L J Brewer

Cu Geol: Philip Donnerstag

Asst Treas: A R Eikenbary

Asst Sec: T E Congdon
MINERAL POLAR #23,
CACTUS RAT, CANE CREEK,
Grand County, Utah
U₃O₈ prod & development
MORENO SCHOOL SECTION,
San Juan County
(See Ariz, Colo, N Y)

COG MINERALS CORP

Denver Club Bldg,

Denver, Colorado

Pres: W C Norman

VP: J H Nason

Sec: C W McDermott

Treas: D F Taylor

Oper Mgr: Frank A Seaton

SPOOK-BULLSEYE, Fry

Canyon, undergr, U₃O₈, Cu

Mine Supt: Homer Taylor

Mine Frm: Fred Hymen

Prod: 50 tons daily

Under devel

100-TON FLOT-ORAV

UPGRADE MILL, Fry

Canyon, U₃O₈, Cu

Mill Supt: Homer Dale

(See Calif, Colo)

COLORADO CONSOL MINES CO

1114 Walker Bank Bldg,

Salt Lake City

Pres: H E Raddatz

VP: Harriet D Travis

Sec: Glen Hardy

Gen Mgr: M D Paine

COLORADO CONSOLIDATED

MINE, (Leases) Dividend,

2 mi SE of Eureka, undergr,

Pb, Au, Ag, Cu

Idle

COLORADO FUEL & IRON CORP

Fuelco, Colo

Pres: A F Frans

VP: J J Martin

Sec: D C McGrew

Gen Mgr: R R Williams, Jr

Purch Agt: L C Rose

BLOWOUT, COMSTOCK &

DUNCAN MINES,

Cedar City, Utah, open pit, Fe

Res Eng: John Robertson, Jr

Prod: 3000 tons

(See Colo, Wyo)

COLUMBIA IRON MNG CO

(Subsid U S STEEL CORP)

120 Montgomery St,

San Francisco, Calif

Pres: L B Worthington

Exec VP: L J Westhaver

VP-Oper: J D McCall

Sec: D J McDaniel

Mgr, Raw Mat Devel:

Ch Eng: W F Pruden

Dir, Ind Rel & Safety:

C T Spivey

Dir of Purch: H W Christensen

MINES, Iron Mtn & Desert

Mound 20 mi W of Cedar City,

surface, Fe

Gen Supt: G D MacDonald

Mine Eng: J D Quinn

CRUSHING & SCAVENGING

PLANTS, Desert Mound & Iron

Mtn

(See U S Steel, Alaska, Ala,

Calif, Ky, Minn, Pa, Tenn, Utah,

Wyo)

COL-U-MEX URANIUM CORP

615 Simms Bldg,

Albuquerque, N Mex

Pres: Tom F Harrington

VP: Ed S Ketchum

DOROTHY MAY MINE, Big

Indian Mng dist, San Juan

County, undergr,

Asst Gen Mgr: William R McCormick

Asst Gen Mgr: Russel L Wood

Gen Supt: Robert M Hurst

Geol: Robert R Ward

Mine Supt: David E Antell

Prod: 100 tons

(See N Mex)

COMBINED METALS REDUCTION CO

Box 150, Salt Lake City 10

Pres & Gen Mgr: E H Snyder

VP: E H Snyder, Jr

VP, Eng: W H Kelsey

Treas: A C Merrill

Sec: Don Ballard

Purch Agt: E G Black

Research Mett: Paul Gemmill

Research Mett: Corwin Likens

Mech Eng: Malcolm L Ord

BAUER PLANT OPS: Stockton,

Pb, Zn

Gen Supt: I C Droubay
Mine Supt: O D Cameron
Mill Supt: Winford Hector
Met: Rex Hayes
Master Mech: Kenneth Sheldis
Office Mgr: Frank Andrews
1200-TON FLOT MILL
Assayer: Kay Hanson
RESIN REFINERY
(See Nev)

COMSTOCK URANIUM & OIL CORP

211 Phillips Petroleum Bldg,

Salt Lake City

Pres: S A Walsh

VP: Wm A Saari

Sec-Treas: L K Nicholson, Jr

Cons Genl: J J Beeson

(See Nev)

CONRAD URANIUM CO

55425 1700 West,

Salt Lake City

Sec: C J Matthews

CONRAD #3 MINE, San Rafael

dist, Emery County, U₃O₈

Under devel

CONSOL EUREKA MNG CO

317 Kearns Bldg,

Salt Lake City

Pres: James E Hogle

VP: J C Johnson

Sec-Treas: L J Lerwill

Gen Mgr & Purch Agt:

Sherman D Kinckley

(See Nev)

CONTINENTAL MATERIALS CORP

(Formerly CONTINENTAL URANIUM, INC)

P.O. Box 1350, Grand Junction,

Calif

Pres: Willard Gidwitz

Sec: Max H Braun

Ed Chmn: Gerald Gidwitz

CONTINENTAL NO 1, LaSal,

undergr, U₃O₈, V₂O₅

Gen Supt: C H Reynolds

Geol: H M Smithson

Gerald Brooks

Met: James C Ternahan, Jr

Mine Supt: Clarence O Cox

Prod: 100 tons

(See Colo, Wyo & Woodmont,

Ida, Utah)

COX, LESTER

P.O. Box 346, Greenriver

MINE, U₃O₈

CROFF OIL CO

308 Crandall Bldg, P.O. Box

2045, Salt Lake City

Sec: Maxwell Bentley

CORVUSITE MINE, Beaver

Mesa dist, Grand County,

undergr, U₃O₈

Under devel

CUPRIC MINES CO

38 Exchange Place, Room 29,

Salt Lake City 11

Sec-Treas: David H Bullough

NEWHOUSE-CACTUS MINE,

San Francisco dist, Beaver

County, open pit development,

Cu

DEBUS, H C

c/o Jones Realty, Moab

MINE, U₃O₈

DELTA MNG CO

c/o E G Hall, P.O. Box 51,

Monticello

MINE, U₃O₈

DIAMOND URANIUM CORP

305 Ness Bldg,

Salt Lake City, Utah

LEMUEL LITTLE MAN #2

MINE, open pit, U₃O₈

DOLA BELLE MNG CO

Thompson

MINE, U₃O₈

DOWD, JOE & SONS

41 W 1st N, Moab

MINE, U₃O₈

DRAGON CONSOL MNG CO

c/o L J Eliason,

International Smelting &

Refining Co, R F D #1,

Tooele

Pres: Roland B Mulchay

VP: Richard Knight

Sec-Treas: L J Eliason
Purch Agt: T K Davis
DRAGON MINE, 4 mi S of
Eureka, undergr, surface,
halloysite clay, Au
Geol: M B Kildala
(Lessee, Filtrrol, Inc, Salt
Lake City)

DUSTY FIVE MNG CO

Blanding

MINE, U₃O₈

EAGLE & BLUE BELL MNG CO

608 Dooly Bldg,

NECLA MNG CO

Pres: L J Randall
Mgr of Mines: W H Love
RADON MINE, Big Indian dist., near Moab, undergr., U₃O₈
Mine Supt: Philip Lindstrom
Mine Frnt: Grant Ealick
Mine Eng: Vernon Davis
Prod: 150 tons
(See Idaho)

HIDDEN SPLENDOR MNG CO, THE

First Security Bldg., Salt Lake City
Pres: A Payne Kibbe
VP: Gen Mgr: Dale I Hayes
VP: David A. Hirsch
Sec-Treas: Edward R Farley, Jr.
Purch Agt: Jack E. Hoffenbeck
Controller: Ray Gough
Staff Geol: Ray E. Wimber
Ch Geol: Edwin T. Wood
FAR WEST MINE, Big Indian Wash, San Juan County, undergr., U₃O₈
Dist Supt: G H Shefelbine
Geol: William B. Loring
Dist Eng: J M Newman
Master Mech: Charlie Wilson
Mine Supt: John R. Mullen
Mine Frnt: Joe D. Bierschied
Mine Eng: Edward T. Dwyer
Prod: 850 tons per day
COLUMBIA SHAFT, undergr., U₃O₈
Mine Supt: Harry S. Fuller
Prod: 300 tons per day
KE SHAFT, undergr., U₃O₈
Mine Frnt: Albert P. Edwards
Prod: 300 tons per day
(Child of Atlas Corp.)
(See Colo.)

HOMESTAKE MNG CO, UTAH DIV

100 Rush St., San Francisco, California
NORTH ALICE MINE, Big Indian dist., San Juan County, undergr., U₃O₈
VP & Gen Mgr: A H Shoemaker
Gen Supt: Gordon M. Miner
Asst to Pres: Paul C. Henahan
Mine Frnt: Jefferson Taylor
Eng: Walt Weid
(See Calif., N Mex., S D, Wyo.)

HORN SILVER MINES CO

38 Exchange Place, Salt Lake City
Pres: D M. Drabes Sr.
VP: Robert A. Hunt
Sec-Treas: D H. Bullough
HORN SILVER MINE, Milford, Ariz., Ag, Pb, Zn
Idle

HUNT & SMITH

Bicknell
MINE, U₃O₈

IDEX GOLD MINING CO

235 S 5th East, Salt Lake City
VP: Philip S. Knight
Sec-Treas & Gen Mgr: Richard Knight
IDEX MINE (Leased) near Delta, in Drum Mt. dist., undergr., Co, Au, Ag
Idle

INDEX-DALEY MINES CO

118 N Main St., Salt Lake City 16
Pres-Purch Agt: Charles S. Woodward
VP: Glen A. Finlayson
Sec-Treas: R W. Edmunds
INDEX MINE, Wells, Nev., undergr., Ag, Pb, Co, Au
Gen Mgr: Charles S. Woodward
Gen Supt-Mine Supt: George A. Rich
Under devel.
(See Nev.)

INDUSTRIAL URANIUM CO

275 So Main, Salt Lake City
Pres: Robert M. Schubach
Sec-Treas: Wilford M. Burdick
MOONLIGHT, STARLIGHT & BUNLIGHT MINES, P.O. Box 436, Mexican Hat, undergr., U₃O₈, V₂O₅, Cu
Asst Gen Mgr: C R. Ramsey
Gen Supt: John Borkert
Prod: 300 tons

INDUSTRIES & MINES INC

85 Broad St., New York 4, New York
DEL MONTE, DANY JUNE, CONGRESS, EAGLES & CHIEF MINES, Henry Mts., undergr. & surface, U₃O₈, V₂O₅, Au, Ch, Ta
Gen Mgr: James M. Knapp
Asst Gen Mgr: Edward Hotsch
Geol: Stuart St. Clark
Asst Gen Mgr: Wm. Keenan
Prod: 1,500 tons & developing
(See N Y)

INSPIRATION LEAD CO, INC

P.O. Box 178, W 900 Sprague Ave., Spokane 10, Wash
PROPERTIES, Brumley Ridge, E of Moab, Grand County, U₃O₈
CLAMS, W of Blanding, Big Indian dist., San Juan County, U₃O₈
Explor
(See Idaho)

INTERNATIONAL OIL & METALS CORP

280 Loma Dr., Los Angeles 35, California
Exec VP: Louis H. Seagrave
DIVIDE MINE, Big Indian dist., San Juan County, undergr., U₃O₈
Prod: 10,000 tons per year

INTERNATIONAL SMELTING & REFIN CO

Kearns Bldg., Salt Lake City
Ore Buyer: Glen A. Burt
Ch Geol: M B. Kildale
Purch Agt: T K. Davis
PLANT OPERATIONS, Tootle, Ariz., W J. McKenna
Gen Supt: E W. Steinbach
Ch Clerk: L J. Ellison
Plant Eng: Earl House
Personnel & Safety: T K. Voyer
(See Ariz.)

ISBELL CONST CO

Box 2551, Reno, Nev.
HAPPY JACK URANIUM MINE, Fry Canyon, contract mng for Texas-Zinc Minerals Corp.
Supt: Dick Strand
(See Ariz., Idaho, Nev., Wash.)

J & M MNG

Cleveland
MINE, U₃O₈

JAHNKE, ROLAND

309 Hill Dr., Grand Junction, Colorado
MINE, U₃O₈

JEN, INC

Box 456, Moab
Chmn of Bd: E H. Snyder
Pres: C E. Tuttle
VP: E H. Snyder, Jr.
Sec-Treas: C M. Christensen
CORD MINE, Big Indian dist., San Juan County, U₃O₈
Gen Supt: Wm J. Franklin
Mine Frnt: Herbert E. Jones
Prod: 450 tons per day

JENSEN, WESLEY

Price
MINE, U₃O₈

JOLLY JACK URANIUM

625 Judge Bldg., Salt Lake City
PROPERTIES, White Canyon area, Big Indian dist. & Garfield County, U₃O₈
Mine Supt: Vernon R. Allen
(See Calif.)

JONES, E N

Gen Del. Thompson
MINE, U₃O₈

K & J MNG CO

Moab
MINE, U₃O₈

KEN EL URANIUM

P.O. Box 191, Montrose, Colo
MINE, U₃O₈

KERNECOTT COPPER CORP, UTAH COPPER DIV

P.O. Box 1850, Salt Lake City 12
Gen Mgr, Utah Copper Div: F C. Green

Asst Gen Mgr, Utah Copper Div

I K. Hearn
Gen Supt of Oper, Utah Copper
Div: J C. Landenberger
Dir, Indus. Rel: M C. Strittmatter
Dir, Communications: D C. Houston
Dir, Safety & Fire Control: E K. Olson

Dir, Public Rel: H W. Aldrich
Dir, Controller: J P. O'Keefe
Asst Div. Compt: O C. Hadsen
Ch Eng: A J. Thull, Jr.
Ch Mine Acct: S W. Jacques
Ch Mill Acct: C R. Brooks
Storekeeper, Mill: G H. Kavanagh

Storekeeper, Mine: A J. Bohrer
Ch Refinery Acct: H L. Erickson
Ch Ref. Rel: R P. Anderson
Master Mech, Mine: S A. Goudenoust
Gen Master Mech, Mills: L. Balde

Master Mech, Magna: W L. Hendrickson
Master Mech, Arthur: J W. Ledingham
Traffic Mgr: A L. Pratt
CENTRAL POWER STATION, Garfield
Ch Eng: J H. Hartline
MILLS ORE HAULAGE, Garfield

Supt: L S. Hills
BINGHAM MINE, Bingham Canyon, Cu
Mine Supt: V S. Barlow
Maint. Dept. Supt: J A. Horden, Jr.
Open Dept. Supt: Ray F. Gough
Employment Dir: L O. Hamlin
Safety Eng: Rose Pino
MAGNA & ARTHUR MILLS, Garfield

Mill Supt: F H. Ensign
Dir. Quality Contr: C G. Quigley
Supt, Magna: T J. Hubbard
Supt, Arthur: Neil Plummer
Asst Supt, Magna: T J. Barber, Jr.

Employment Dir: M A. Moffat
Ch Elec Eng: R J. Corfield
Safety Eng: R L. Erickson
Ch Met Eng: A G. Johnson
Ch Anal Chem: V A. Fraser
UTAH REFINERY, Garfield
Supt: W H. Burt
Refin. Dept. Supt: K H. Koropp
Met Eng: C A. Zeldin

Plant Eng: I G. Salisbury
Master Mech: R F. Johnson
GARFIELD WATER & IMPROVEMENT CO, Garfield
Supt: C R. Naylor
(See Ariz., Nev., N Mex., N Y & Bear Creek Mng. Utah)

KENO MNG & MFG CO

235 S 5th East, Salt Lake City 2
VP: Philip S. Knight
Sec-Treas & Gen Mgr: Richard Knight
IBEX MINE (Leased), Detroit Mng. dist., north end of Mineral Mt. range, undergr., Ag, Pb
Idle

KERN COUNTY LAND COMPANY

Newhouse Bldg., Salt Lake City
Consulting Geol: Sidney S. Alderman, Jr.
Mgr, Minerals Dept: Wm T. Griswold
(See Ariz., Calif., Idaho)

KILDOW, HARRY

209 N. Auburn Ave., c/o Vernon Bloomfield, Farmington, N Mex.
MINE, U₃O₈

KLABUNDE, LOU & BENNETT, RAY A

P.O. Box 2727, Denver, Colo
MINE, U₃O₈

KNAPP URANIUM DEVEL

555 E 5400 S, Salt Lake City
Pres: Clyde J. Knapp
(Mines leased out)

LA SAL MNG & DEVEL CO

Box 563, Moab
LA SAL MINE, Big Indian dist., San Juan County, undergr., U₃O₈
Mine Supt: Gordon Miner
Asst Mine Supt: E F. Jacobson, Jr.
Mine Frnt: Donald Waterman
Mine Eng: Walt Weid
Prod: 250 tons
(See Calif.)

KLABUNDE, LOU & BENNETT, RAY A

P.O. Box 2727, Denver, Colo
MINE, U₃O₈

KNAPP URANIUM DEVEL

555 E 5400 S, Salt Lake City
Pres: Clyde J. Knapp
(Mines leased out)

LA SAL MNG & DEVEL CO

Box 563, Moab
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Mine Supt: Gordon Miner
Asst Mine Supt: E F. Jacobson, Jr.
Mine Frnt: Donald Waterman
Mine Eng: Walt Weid
Prod: 250 tons
(See Calif.)

LA SHUBERCO MNG CO

Box 363, Marshfield, Wis.
Pres: Grant Johnson
VP: W W. Mittelstadt
Sec: Fred Wolf
Treas: Dan Rosch
LITTLE EVA MINE, Yellow Cat dist., Grand County, undergr., U₃O₈, V₂O₅

LINDQUIST, JOE

Thompson
MINE, U₃O₈

LISBON URANIUM CORP

304 First Security Bldg., Salt Lake City
Pres: A P. Kibbe
VP: Eric C. Ryberg
Sec: Max B. Lewis
Treas: Glen L. Davis
KE MINE, Moab, undergr., U₃O₈
Geol: Harold W. Blakely
Mine Supt: Albert P. Edwards
Prod: 200 tons per day
COLUMBIA MINE, Big Indian dist., undergr., U₃O₈
Geol: William B. Loring
Mine Supt: Harry S. Pollard
Prod: 225 tons per day
(See Colo, Mont, Wyo, N Mex.)

LA SHUBERCO MNG CO

Box 363, Marshfield, Wis.
Pres: Grant Johnson
VP: W W. Mittelstadt
Sec: Fred Wolf
Treas: Dan Rosch
LITTLE EVA MINE, Yellow Cat dist., Grand County, undergr., U₃O₈, V₂O₅

LINDQUIST, JOE

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MINE, U₃O₈

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Pres: A P. Kibbe
VP: Eric C. Ryberg
Sec: Max B. Lewis
Treas: Glen L. Davis
KE MINE, Moab, undergr., U₃O₈
Geol: Harold W. Blakely
Mine Supt: Albert P. Edwards
Prod: 200 tons per day
COLUMBIA MINE, Big Indian dist., undergr., U₃O₈
Geol: William B. Loring
Mine Supt: Harry S. Pollard
Prod: 225 tons per day
(See Colo, Mont, Wyo, N Mex.)

LYNN MINING CO

c/o Allen Lynn, Box 407, Grantsville, Mo
MINE, Fe

M L D MNG CO

Farmington, N Mex.
MINE, in Utah, U₃O₈

M R & B MNG & EXPL CO

Box 555, Green River
MINE, U₃O₈

MARCY-SHENANDOAH CORP

Jarvis Bldg., Durango, Colo
Pres-Gen Mgr: S Stokes Tomlin, Jr.
VP & Geol: E M. Bargo
Sec: R M. Schell
Treas: Robert R. Snodgrass
Purch Agt: Edwin A. Larson
MOTCH NO 4 MINE, W of Blanding, undergr., U₃O₈
Idle
(See Ariz., Colo.)

MASCOT MINES, INC

Box 986, Kelllogg, Idaho
Pres: Malcolm C. Brown
VP & Purch Agt: Cunham Bell
Sec-Treas: H F. Magnuson
COLORADO RIVER MINE, Box 985, Moab, Hatch Point, San Juan County, undergr., U₃O₈
Gen Mgr: Claude Nugent
Mine Supt: Inar Morgaard
Idle
(See Idaho)

McCULLAN, J L

Thompson
MINE, U₃O₈

McFARLAND & HULLINGER

Box 235, Tootle
Partners: F G. McFarland, S R. Hullinger
OPHIR UNIT, Tootle County, Zn
MAYBE MINE, White Canyon dist., San Juan County, U₃O₈
(See Ariz.)

MCNEIL & HUGHES

1303 S Hill, Oceanside, Calif.
MINE, in Utah, U₃O₈

McNEILL, ELLIS V

Huntington
MINE, U₃O₈

MICRO COPPER CORP

Marshall Court, Moab, Utah
Pres: Richard N. Mohler
Sec-Treas: Ellis R. Cook, Jr.
ALLEN #1 MINE, Red Canyon, San Juan County, U₃O₈, V₂O₅, undergr.

Q. ARELL, PATTY, SUNRIS, PICKETT CORRAL MINES, Bull Canyon, Montrose, Colo, U₃O₈, V₂O₅, undergr.

RED ROCK, WILD CAT MINES, Martin Mesa, Montrose, Colorado City, Colo, U₃O₈, V₂O₅, undergr.

Gen Supt: Everett Blackburn

Placerville, Colo
Prod: 25 tons
Under devel.
(See Calif.)

MID CONTINENT URANIUM

Uranium Center Bldg., Grand Junction, Colo
JOHN DECLINE MINE, Thompson, Yellow Cat dist., Grand County, U₃O₈, V₂O₅
(Leased to Lenwood H. Wilkerson, P.O. Box 3, Thompson)
Prod: 5 tons
(See Colo.)

MINERAL KING MINES CO

825 N T W, Provo
Pres: M E. Curtis
MINERAL KING MINES, SE of Circo, undergr., open pit, U₃O₈, V₂O₅
Under devel.
YELLOW TOM MINES, SE of Circo, undergr., open pit, bentile
Under devel.

MINERALS PROD CO

810 Road Ave., Grand Junction, Colo
MINE, in Utah, U₃O₈

MOAB DRILLING CO

32 E Central St., Moab
Pres: Charles Steen
Gen Mgr: Max D. Pierson
DIAMOND DRILLING

MOAB SURVEY SERVICE

Moab
MINE, U₃O₈

MONOGRAM URANIUM & OIL CO

205 Petroleum Bldg., Grand Junction, Colo
Pres: Ray Baxter
VP: Howard F. Carr
Sec-Treas: Geo. Dills
DESERT MOON MINE, Green River, undergr., U₃O₈, V₂O₅
Mine Supt: Joseph R. Trudgion
Prod: 35 tons
(See Calif.)

MONTE CRISTO URANIUM CORP

1003 Continental Bank Bldg., Salt Lake City
Pres & Treas: Richard Minasian
VP: Demost. Neilson
Sec: Clarence C. Neslen
HONEY BEE 1 & 2 MINES, Cane Springs Canyon, San Juan County, undergr., U₃O₈, V₂O₅
(Oper under lease by the Skidmore Mng Co of Dolores, Calif.)

MONTICELLO MNG CO

c/o Leon Adam, Monticello
MINE, U₃O₈

MORRIS, LEE H & GUS

Box 586, Green River
M & M, DESERT RATS GROUPS, open pit, U₃O₈, Van
Idle

MOUNTAIN MINERALS INVEST CO

Congress Hotel, 2nd S & State, Salt Lake City
Pres: Donald Gilman
VP: Richard Hunt
Sec-Treas: Marie K. Reeves
POCO BUENO MINE, Gold Hill, Tootle County, undergr., Ag, Pb, Zn, Au, Cu
Idle

MULFORD, WELLS

Torrey
MINE, U₃O₈

MYSTERY-SNIFFNER MINES INC

Beaver
Pres: W R O'Keefe
VP: L E. Heathman
Sec-Treas: B L. Flood
Purch Agt: R E. Lee
MYSTERY-SNIFFNER MINES, 16 mi NE of Beaver, undergr., U₃O₈
Gen Mgr: W R O'Keefe
Asst Mgr: L. Hollingshead
Gen Supt: W R O'Keefe

Gentl Edwin Poehlmann
Mine Supt: L Hollingshead
Mine Eng: E Poehlmann
Prod: 40 tons
40-TON MILL, Beaver
Assayer: Crisman-Nichols

NATIONAL LEAD CO., INC. (Member of Nuclear Metals Div of NATIONAL LEAD CO) Contract Oper for Atomic Energy Commission Uranium Mill

Monticello
Gen Mgr: G K Coates
Gen Frm: F A Montella
Sampling Plant Supt: R H Pehrson
Safety Eng: J E Bailey
Tech Supt: E D Dickerman
Ch Eng: H R Saunders
Ind Rel Asst: W F Carmon
Comptroller: G L Holt
Purch Agt: S L Mayne
Maint Supt: T O Zefell
See Colo, S D, & National Lead Co, NY)

HAZER, GLEN
Blanding
MINE, U₃O₈

NEVADA PARK MNG CO.
235 S 5th East,
Salt Lake City
Sec-Treas & Gen Mgr:
Richard Knight
(See Nev)

NEW PARK MINING CO
901 Walker Bank Bldg,
Salt Lake City
Pres & Gen Mgr: W H Crammer
VP & Mgr of Oper:
Clark L Wilson
Sec: Robert L Crammer
Treas: R C Wilson
Purch Agt: Carl D Harper
MAYFLOWER MINE, Kestley,
undergr, Au, Cu, Pb, Zn
Gen Supt: Gale A Hansen
Geol: Walter E Bauer
Prod: 115 tons

HOONAN, RALPH J
Box 11, Blanding
MINE, U₃O₈

NORTH BINGHAM CONSOL MNG CO
P O Box 37, Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr:
Richard Knight
Idie

NORTH WESTERN MNG & EXPL CORP
5 SW 136th St, Seattle 66,
Wash
Pres: Albert L Worlman
VP: Lyman Battey
Sec-Treas: James E Williams
CONSOLIDATED MINE, Emery
County, undergr, V₂O₅, U₃
U₃O₈
Gen Supt: James E Williams
Idie
(See Montana, Washington)

PAY DAY MINES
c/o Earl Holts,
Slick Rock, Colo
MINE, in Utah, U₃O₈

PHILLIPS PETROLEUM CO., STRATEGIC MINERALS SECTION
Phillips Petroleum Bldg,
Salt Lake City
Dist: Clifford H Holmes
Asst Dir: David C Arnold
Mng Eng: Roger Caywood
(See N Mex, Okla)

PIUTE URANIUM CORP
39 Exchange Place,
Salt Lake City
Pres: N B Dodge
VP & Sec: D M Draper, Sr
Treas: D H Bullough
PROPERTIES, Beaver County,
Pb, Zn

PLUTUS MNG CO
608 Doody Bldg,
Salt Lake City
Pres: Cecil Fitch
VP & Gen Mgr:
Cecil Fitch, Jr
Sec & Purch Agt: W W Watson
PLUTUS MINE, Eureka,
undergr, Ag, Pb, Au
Idie

PRESLEY, B R & TANNER, HULEN J
P O Box 931, Blanding
MINE, U₃O₈

RADIUM KING MINES, INC.
364 So 5th East,
Salt Lake City
Pres: Joe A Minton
VP: Robert J Minton
Sec-Treas: David L McKay
Asst Sec: K B Christenson
VP & Gen Supt: D F Harrison
VP & Ch Geol: A E Flint
Mech Eng: Chas A Scheer
ULA MINE, Red Canyon dist,
San Juan County, Cu, U₃O₈
Mine Frm: W A Swank
Mine Eng: Ed Carnahan
Prod: 200 tons

RAINBOW GOLD MINES CORP OF DELAWARE
P O Box 187, Marysville
Pres: Louis C Deluke
VP-Sec: Lucy Deluke
Treas: A Paul Deluke
COPPER BELT MINE, Piute
County, undergr, Au, Ag,
Cu, Pb, Zn
Under devel

RAMSEY, McCORMICK & MARSING
Grand Junction, Colorado
MINE, U₃O₈

RARE METALS CORP OF AMERICA (Affiliate of EL PASO NATURAL GAS CO)
1st Security Bldg,
Salt Lake City
Pres: C L Perkins (Box 1492,
El Paso, Tex)
VP & Asst Gen Mgr: M H Kline
Sec-Treas: Virgil Rittmann
Asst Sec: Anne Kidd
Ch Eng, Explor Dept:
J R Reynolds
Ch Geol: L A Hansen
Supervisor, Land Dept:
R O Baldwin
Supt, Production Dept:
A A McKinney
Supt, Explor Dept:
E J Carlson
Ch Chem: R Kronstadt
Purch Agt: Claude J Jenkins
Explor
(See Ariz, Idaho, N Mex)

REDD, PRESTON
P O Box 533, Blanding
MINE, U₃O₈

RICO ARGENTINE MNG CO
217 Kearns Bldg,
Salt Lake City
Pres & Gen Mgr:
Sherman B Hinchley
VP: J C Johnson
Sec: L J Lerwill
Treas: B B Hall
(See Colo)

ROYAL URANIUM CORP
P O Box 1844, Palo Alto,
California
ROYAL MINE, (Indian Creek
Group) Monticello dist, San
Juan County, U₃O₈
Gen Mgr: Robert L Crammer
Idie
(See Calif)

SALT LAKE TUNGSTEN CO, THE
2160 Indiana Ave,
Salt Lake City
Pres: Blair Burwell
TUNGSTEN REFINERY,
"Synthetic Scheelite"
Mill Supt: Leonard Marinelli
Asst Mill Supt: Benrus Johnson
Idie

SAN FRANCISCO CHEM CO
Dr F, Montpelier, Idaho
ARICKERIE MINE, NE of
Randolph, undergr, phosphate
rock
Gen Supt: Charles C Stephens
(See Idaho, Wyo)

SAN RAFAEL MINES INC
Box 398, Huntington
MINE, U₃O₈

SHASTA MINERALS & CHEMICAL CO
613 Doody Bldg,
Salt Lake City 1

Pres: K L Stoker
VP: Harper Hunsaker
Sec-Treas: Nancy C Hardman
(See Calif)

SHATTUCK DENN COMPANY (Wholly owned subsidiary of SHATTUCK DENN MNG CORP)
120 Broadway, New York 5,
New York
BAIRDON MINE, Box 246, Moab,
undergr, U₃O₈, V₂O₅
Gen Mgr: T W Newell
Gen Supt-Mine Supt:
Frank Garrett
Geol-Mine Eng: Carl Appella
Mine Frm: Leo Zintik
Office Mgr-Purch Agt:
J D Hill
Prod: 100 tons per day
(See Colo, NY)

SHUMWAY BROS
Blanding
Partners: Merwin Shumway,
Burdett Shumway, Eugene
Shumway, Glen A Shumway
CLOUDY DAY MINE, KING
EDWARDS MINE, Elk Ridge
dist, San Juan County, U₃O₈

SHUMWAY URANIUM MNG CORP

539 Surety Life Bldg,
Salt Lake City
Pres & Gen Mgr: Trent Parker
Treas: Owen Summison
Sec: Robert B Hanson
SANDY MINE, White Canyon
dist, San Juan County, U₃O₈

SHUPE & ALLRED
P O Box 314, Moab
MINE, U₃O₈

SILVER BUCKLE MNG CO
304 Walker Bank Bldg,
Salt Lake City
Pres: Dr F E Scott
VP & Gen Mgr: Clark L Wilson
Sec: Alden Holt
Treas: Jack D Gay
URANIUM PROP, Big Indian
dist, San Juan County
Explor
(See Idaho, Wash)

SIMPSON, FRED J & SELLARS, J L
2549 F Rd, Grand Junction
Colorado
MINE, U₃O₈

SIOUX MINES COMPANY
114 Walker Bank Bldg,
Salt Lake City
Pres: H E Raddats
VP: M D Paine
Auditor: Glen Hardy
SIOUX MINE, Tintic dist, Utah
County, Au, Ag, Cu
(Lease Operation)
Idie

L H SMITH MINING CO
Box 932, Monticello
Gen Mgr: L H Smith
INDIAN CREEK MINES,
undergr, U₃O₈, V₂O₅
Under devel

STADTER, ROBERT L
Box 907, Monticello
MINE, U₃O₈

STANDARD URANIUM CORP (STANDARD COL-U-MEX JOINT VENTURE)
284 South 4th East, Moab,
Utah, P O Box 599
Pres & Gen Mgr:
William R McCormick
VP: Mitchell Mellich
Sec: Aaron Holman
Treas: I Newton Brosan
Asst Gen Mgr: Russell L Wood
Purch Agt: James B King
BIG BUCK MINE, Big Indian
dist, U₃O₈
Mine Frm: Robert Hurst
Geol: Robert R Ward
(See Ariz, Colo)

STAR DUST MINES, INC
No 4, 283, E South Temple
Salt Lake City
Pres & Gen Mgr: Fred Cook
VP: Leslie J Battey
Sec-Treas: W M Hance
Purch Agt: M V Cook
STAR DUST MINE, Gold Hill,
undergr, surface, WO₃
(See Nev)

STEWART, W R
Box 758, Moab
MINE, U₃O₈

SUNBURST INC
1975 NW Everett St,
Portland 9, Oreg
SAN JUAN CLAIMS, Lander
County, undergr, U₃O₈
(See Nev, Oregon)

SUN RAY MNG CO
Naturita, Colo
MINE, in Utah, U₃O₈
(See Colo)

SUNRISE MNG CO
Box 368, Monticello
SUNRISE MINE, White Canyon
dist, San Juan County, U₃O₈
Prod: 1800 tons per year

SUNSHINE MNG CO
136 Peyton Bldg,
Spokane 1, Wash
(See Ariz, Idaho, Wash)

TEMPLE MOUNTAIN URANIUM CO
39 Exchange Place,
Salt Lake City
Pres: Herman Heinicke
VP: Geo Heinicke
Sec-Treas: Augustus Reeves
CLAIMS, Green River, Torrey,
undergr, surface, Ag, Pb
Prod: 183 tons
Idie

TEXAS-ZINC MINERALS CORP (Subsidi of New Jersey Zinc Co)
1128 Colorado Ave,
Grand Junction, Colo
Pres: A L Hayes
HAPPY JACK MINE, White
Canyon, undergr, U₃O₈
Gen Supt: N K Banks
Mine Supt: E J Swapp
1000-TON MILL, Mexican
Hill
Mill Supt: K C Apland
(See Colo)

THOMPSON, J R
Box 364, Danbury, Conn
Op: E Lewis & Associates
BLACK STONE 1-9 MINES,
Yellow Cat dist, Grand
County, U₃O₈

THORNBURG MNG CO
140 W Main St,
Grand Junction, Colo
Own & Gen Mgr:
Vance Thornburg
Sec-Treas: J T Tunnell
CORRAL MINE, 12 1/2 mi NW
of Moab, undergr, U₃O₈
Mine Supt: Edward G Johnson
Prod: 25 tons
(See Colo)

TINTIC LEAD CO
39 Exchange Place,
Salt Lake City
Pres: Robert A Hunt
VP: D M Draper, Sr
Sec-Treas: D H Bullough
MINE, Milford, open pit, Cu
(Leased)

TINTIC STANDARD MNG CO

114 Walker Bank Bldg,
Salt Lake City
Pres: H E Raddats
VP: Roy M Jacobs
Treas & Gen Mgr: M D Paine
Sec: Glen Hardy
Eng-Geol: Fred W Hanson
TINTIC STANDARD MINE,
Divided, undergr, Au, Ag,
Cu, Pb, CaF₂
Under devel

TINTIC URANIUM CO
114 Walker Bank Bldg,
Salt Lake City
Pres: H E Raddats
VP: L L Travis
Sec: Glen Hardy
Treas: M D Paine
PATS PROPERTY, P O Box
633, Moab, U₃O₈
Mine Supt: Ralph E Hawks
Prod: 7 tons per day

TOPAZ URANIUM CO
Delta
Pres: Richard D Moody
VP: M Ward Moody
Sec: M J Moody
GOODWILL MINE, open pit,
U₃O₈
Prod: 50 tons

TRIANGLE MNG & MFG CO

Box 141, Monticello
Owners: LeRoy H Smith,
William Churchill,
Calvin Reed
HART DRAW & INDIAN
CREEK MINES, Monticello,
undergr, open pit, U₃O₈,
V₂O₅
Gen Mgr: LeRoy H Smith
Prod: 50 tons per day
100-TON GRAY MILL, Hart
Draw, Sand Shive
Separation
Mill Supt: LeRoy H Smith
TRIDENT MNG CO
Box 116, Green River
MINE, U₃O₈

TWENTIETH CENTURY FUELS INC

8907 Wilshire Blvd,
Beverly Hills, Calif
Asst Sec: D Howe Moffatt,
Continental Bank Bldg,
Salt Lake City
DIRTY DEVIL NO 6, 7
MINES, HONDU NO 1 MINE,
San Rafael dist, Emery County,
U₃O₈
Under devel

TWO STATES URANIUM CO

Box 37, Bountiful
Pres: Dr D K Christensen
VP: Dr W C Lee
Sec: Frank C Neilson
Treas: R H Schluter
A & B, M & M, Nye County,
Nevada, undergr, Hg
Gen Mgr: M D Fagen
Geol: Kenneth McGriffin
Under devel
(See Nevada, Wyo & Peterson,
Mf & Lorena, in Nevada)

UMONT MNG CO

913 Kearns Bldg, Salt Lake
City 1, Utah
Pres: L F Evans, Jr
VP: D G Foreman
Sec-Treas: V P
R H Wadhams
VP-Gen Mgr:
Dooley P Wheeler, Jr

UNION CARBIDE NUCLEAR CO, A DIV OF UNION CARBIDE CORP
P O Box 1648, Grand
Junction, Colorado
MINE, Green River, U₃O₈
MILL, Green River
Mill Supt: D M Pembroke
(See Calif, Colo, N Y, Wyo)

UNITED MERCURY & OIL CORP
1901 E Glenoaks Blvd,
Glendale 6, Calif
Pres: W Andryus
VP: E Davis
Sec: G Kihory
Treas: H Swanson
MINE, near Milford, open pit, S
Gen Mgr: G Kihory
Asst Gen Mgr: G Hogan
Mine Supt: Wm Rowell
GRINDING MILL, near Milford
Also clinker furnace
(See Sulphur Mng & Supply Co,
Cal)

UNITED MINERALS CORP

518 Felt Bldg,
Salt Lake City
Pres & Gen Mgr:
G W Snyder, Jr
VP: G W Snyder, H A Covy
Sec: Gay Snyder
(See Ariz, Nev)

UNITED PARK CITY MINES CO

836 Kearns Bldg,
Salt Lake City
Pres: John M Wallace
VP & Gen Mgr: S K Droubay
Sec-Treas: E L Oskia
Purch Agt: T K Davis
UNITED PARK CITY MINES,
Heber and Park City, undergr,
Pb, Zn, Ag
Gen Supt: G W DeLaMare
Geol: M P Barnes
Mill Worley
Mech Eng: P O Reynolds
Elec Eng: Frank Stone
Asst Mine Supt: Arthur Gray
Mine Frm: William Hauster
Mine Eng: Harry Doppler
Prod: 350 tons daily

Virginia

UNITED STATES

GYPSUM CO

300 W Adams St,
Chicago 6, Ill
MINE, Bigard, open pit,
gypsum
Works Mgr: E G Turley
(See Calif, Colo, Conn, Ill,
Ind, Iowa, Mass, Ohio, Tex, Va)

U S & LARK MINE

Lark
Mgr: Benton Boyd
Asst Mgr: Roy D Healy
Ch Clerk: James A Coffey
Supt, U S Sec: John W Holmes
Mine Frm, U S Sec: Neil Fresh
Supt, Lark Sec: Harold G Wells
Gen Mine Frm, Lark Sec:
Alton L Williams
MIDVALE PLANT

Mgr: H L Johnson
Ore Buyer: Blaine Waite
Office Mgr, Ore Purch Dept:
F X Meyer
Mill Supt: A A Nelson
Dir, Research Lab:
Loran A Creglow
Ch Chem: Francis J Marshall

U S LITHIUM CORP

1205 Walker Bank Bldg,
Salt Lake City
Pres & Gen Mgr: Paul T Walton
VP & Sec: H O Morgan, Jr
(See Calif)

UNITED STATES SMELTING, REFINING & MINING CO

WESTERN OPERATIONS
P O Box 1880, Newhouse Bldg,
Salt Lake City 10

VP & Gen Mgr, West Oper:
G A Glazier
Ind Devl Dir: J M Ehrhorn
UTAH OPERATION
Chief Mech Eng West Oper:
B Ashmuckoff

U S MINE, Bingham dist, Pb,
Zn, Cu
Mgr: Benton Boyd
Supt: J W Holmes

LARK MINE, Bingham dist, Pb,
Zn, Cu
Mgr: Benton Boyd
Supt: H H Wells

MIDVALE PLANT,
Mgr: H L Johnson
FLOT-MILL
Supt: A A Nelson

(See Alaska, Ariz, Mass,
N Mex)

U S STEEL CORP

COLUMBIA-GENEVA DIV
120 Montgomery St,
San Francisco, Calif

VP-Oper: J D McCall
Mgr, Utah oper: L F Black
Gen Supt: H E Terry

BLAST FURNACE, Geneva,
near Provo
(See Alaska, Ala, Calif, Minn,
Pa, Tenn, Wyo)

URANIUM INDUSTRIES

INC
523 Colorado Bldg,
Denver, Colo

Pres: K S Mitty
VANADIUM KING MINES HO
1, 3, 5, Temple Mt dist, Emery
County, U₃O₈

URANIUM KING CORP
320 Ness Bldg,
Salt Lake City

Pres: Joseph Sherman
VP: Francis D Nelson
Sec-Treas: J A Bateman

COVE MINE, White Canyon,
undergr, Cu, U₃O₈
Prod: 30 tons

(Operated under a lease to
C O G Minerals Corp)

URANIUM REDUCTION

CO
557 1st Security Bldg,
Salt Lake City 11

Chm: E H Snyder
Pres: Mitchell Melich
Exec VP: R A Young

VP: Charles A Sween
Sec: C M Christensen
Cont & Treas: John W Louse, Jr

Purch Agt: Rex Jones
MILL, Moab, Acid Leach,
RIP

Gen Mgr: R F Hollie
Plant Supt: L A Painter

Asst Plant Supt: R W Unger
Ch Met: T Iaso

Plant Mgr: Buford Wum
Ch Chem: John Goff

UTAH ALLOY ORES, INC

Room 305, 101 N High St,
Columbus, Ohio

Sec: Simon Nash
YELLOW CAT MINE, Yellow
Cat dist, Grand County, U₃O₈

UTAH CONSTRUCTION

CO
P O Box 970, Cedar City

IRON SPRINGS MINE, 11 mi W
of Cedar City, open pit, Fe
Mgr: E C Delmore

Office Mgr: E J Robinson
Purch Agt: Mark Webster
Geol: R E Melin

Devl Eng: James H Olson
Ch Mine Eng: York F Jones
Prod: 2000 tons per day
(See Calif)

UTEX EXPLOR CO

P O Box 487, Moab
Pres: Charles A Stoen
VP: Wm R McCormick

Sec: Mitchell Melich
Treas: Maxine Stoen Boyd
Exec Asst: Mary Hope

Westbrook
Purch Agt: Margie Shaffer
MI VIDA MINE, undergr,
U₃O₈

Mine Supt-Gen Supt:
Virgil Bilyew

Geol: Max Piarson
Asst Supt: Ted Barrett
Chemist: Lauren Ball

VALLEY-DEAN CORP

Box 27, Bountiful
Pres: Merlin Neish

VP: Arthur Seifert
Sec: Frank C Neilson
Treas: R N Schuler

REDWOOD MINE, Gas Hills,
Wyo,
Gen Mgr: M B Pagen

(Co-own with Two States
Uranium Co)
Prod: 75 tons per day
(See Wyo)

VITRO URANIUM CO

(A DIV OF VITRO CORP OF
AMERICA)
800 W 3100 So St,
Salt Lake City

Pres: W B Hall
Asst to Pres: R N Miller
VP: R C Cole

Sec: W H Dennis
Treas: R T Ruder
Office Mgr: H D Haight

Purch Agt: C A Theobald
800-TON HYDROMETALLUR-
GICAL PLANT, Salt Lake City

Mot: L D Lash
Oper Supt: M T Ellis
Pl Eng: T O Rukavina

Prod Mgr: J D Moore
Ore Buyer: R B Coleman
Ch Chem: G W Hansen

(See Vitro Minerals Corp, Wyo)

W C T ENGINEERING CO

P O Box 123, Belen, N Mex
MINE, U₃O₈
(See N Mex)

WATKINSON MINES

Green River
MINE, U₃O₈

WELCH UNITED

5428 Colbrook Ave,
Lakewood, Calif

MINE, in Utah, U₃O₈

WEST PARK MINING CO

Box 488, Provo
Pres: J H Petersen

VP: Arvil H Scott
Sec-Treas & Purch Agt:
Dean W Payne

WEST PARK MINE, 3 mi S of
Brighton & 8 mi NW of Midway,
undergr, Cu, Ag

Gen Mgr: Arvil H Scott
Geol: E A Hewitt
Prod: 8 tons

WEST TOLEDO MINES

CO
39 Exchange Place,
Salt Lake City

Pres: Sid Spencer
Sec-Treas: David H Bullough

MINES, Alta, Little
Cottonwood dist, undergr, Pb,
Ag

WESTERN GOLD & URANIUM INC

Box 158, St George
Pres: Russell L Richards

VP: R V Wyman
Sec: Berene Backus
Treas: Ralph G Brown

Comptroller: J L Fakler

Mag Dir: C E Prior
Consulting Met: Alan Kiasock

SILVER REEF MINE, Leeds,
undergr, open pit, Ag, Cu,
U₃O₈

Supt Met: Jack K Howell
300-TON FLOT MILL, Silver
Reef

Mill Supt: Jack K Howell
Asst Mill Supt:
Carl Vanlaningham

Assayer: Art Eastman
(See Ariz, Colo)

WESTERN STATE MNG

CO
Moab
MINE, U₃O₈

WHEELWEL MINES CO
100 Ardner St, Caldwell,
Idaho

Pres: William E Wheelwel
VP: Ralph A Wheelwel
Sec-Treas:

Theresa M Wheelwel
MEGATON & PLUTOMIC
GROUP, U₃O₈, V₂O₅

Under devel
(See Nev, Idaho)

WHITE CANYON MNG CO

1129 Colorado Ave,
Grand Junction, Colo

HIDEOUT-WHITE CANYON NO
1, White Canyon Area, San
Juan County, U₃O₈, V₂O₅, Cu,
undergr

Gen Mgr: A F Boyd
Gen Supt: Philip H Lamberton

Geol: Carl F Lipp
Prod: 300 tons
(See Colo)

WILCOX, L E & ROBINETTE

Dragon
MINE, U₃O₈

WILKERSON & ADAMS

MNG
Box 636, Green River
MINE, U₃O₈

WILKERSON, L H

Box 3, Thompson
Own: L H Wilkerson

RINGTAIL MINE, Yellow Cat
dist, Grand County, U₃O₈

WILSON, JOHN & WILLIAM

1505 Bill Holt Homes,
Great Falls, Mont
MINE, U₃O₈

WIMER, J A

Moab
MINE, U₃O₈

WOODMONT, INC

(Wholly owned subsid of
CONTINENTAL URANIUM, INC)
820 S Ninth St, P O Box 1850

Grand Junction, Colo
RATTLESLAKE MINE, Moab,
open pit, U₃O₈, V₂O₅

Mine Supt: John Roscoe
Prod: 200 tons

F M WRIGHT MNG CO

Moab
MINE, U₃O₈

VERMONT

EASTERN MAGNESIA

TALC CO INC

Baldwin Ave,
South Burlington

Pres: E W Magnus
VP & Chmn of Bd: J H Patrick

VP & Gen Mgr: W W Magnus
Treas: R F Patrick

Gen Supt: V A Backels
NO 2 MINE, 2 mi S of
Waterbury, undergr, talc

Mine Frm: Earl Clifton
Prod: 100 tons per day

100-TON DRY GRINDING MILL,
NO 2

Mill Supt: M G Eastman
NO 3 MINE, Hammondsville,
open pit

Prod: 60 tons per day
80-TON DRY GRINDING MILL,
NO 3, Gassetts

Mine & Mill Supt: W A Denzine
NO 4 MINE, 5 1/2 mi N of
Johnson, undergr, talc

Mine & Mill Supt: R W Perkins
MINE Frm: Cliff Allen

Prod: 200 tons per day
100-TON FLOT-DRY GRINDING
MILL

Mill Frm: Ken Stewart

RUBERD CO, THE

300 Fifth Ave, New York,
New York

VERMONT ASBESTOS MINE

DIVISION, Hyde Park
MINE, Lowell, open pit,
chrysotile, asbestos

Gen Mgr: E Matthews
Asst Gen Mgr: W M Page

Geol: L Jordan
Mech Eng: E E Langford

Mine Supt: I M Potter
Asst Mine Supt: R O'Hear

Mine Eng: R K White
MILL, air separation

Mill Supt: C C White
Asst Mill Supt: R C Wescomb
(See N Y)

VERMONT KAOLIN CORP

Rd #2 Bristol
Pres: R B Thurber

Sec: A P Feen
Treas: D W Bostwick

Purch Agt: W P Mould
MINE, Monkton, China clay,
silica, undergr, open pit

Gen Mgr: W P Mould
Gen Supt: L E English

Prod planned: 333 tons per day
Under devel

HYDRAULIC CYCLONE

CLASSIFICATION MILL,
Monkton

VERMONT TALC CO

Chester
Pres: T A Yager

Sec: Giles Blague
MINE, undergr, talc

Mine Supt: Frederick De Zaine
MILL, Chester

VIRGINIA

ALBERENT STONE

CORP OF VA

Schuyler
MINE, Schuyler & Alberene,
Soapstone

Gen Mgr: Frank G Mothes

ALLIED CHEM & DYE

CORP, GEN CHEM DIV
Box 351, Galax

GOSSAN MINES, 6 mi N of
Galax, undergr, phrrhotite
concentrates

Gen Mgr: R H Dickson
Supt: James O Nichols

Mine Frm: R F Dillon
Asst Supt: A H Yarberry

1000 TON FLOT-GRAY MILL
Mill Frm: O W Manuel
(See Colo, N Y)

AMERICAN CYANAMID

CO, PIGMENTS DIV
Piney River

MINE, open pit, limonite &
apatite

FLOT-MILL, Piney River
Mine & Mill Supt: L L Campbell

PLANT
Plant Mgr: J S Carter

Asst Plant Mgr: J F Hopkins
Mech Eng: J M McConaghy

Elec Eng: J Wilson
(See Ark, Fla, Ga, NY)

AMERICAN PIGMENT

CORP
Hawessee
Exec VP: R G Finer

Iron Oxide Pigments

CLINCHFIELD SAND & FELDSPAR CORP

Plant Mgr: W A Hance

COLOR, CRESWELL,
MITCHELL & PEAKESVILLE
MINES, Feldspar

FOOTE MINERAL CO

18 W Chelton Ave,
Philadelphia 44, Pa

SUNBRIGHT DIVISION,
Duffield, c/o W Edwin Dill, Jr

MINE, Sunbright, undergr,
limonite

Gen Mgr: A McDonnell
Asst Gen Mgr: W Hudspeth

Mine Supt: T Evans
Mine Frm: J Hughes

MILL, at mine
CHEMICAL PLANT, at mine
(See N H, N C, Pa, Tenn)

INTERNAT'L MINERALS

& CHEMICAL CORP
Piney River

APLITE MINE

Supt: Claude Ellis
(See Ariz, Colo, Fla, Ill, Maine,
Miss, N Mex, N C, S D, Tenn,
Wyo)

KYANITE MNG CORP

Dillwyn
Pres-VP-Treas: Gene Dixon

Sec: J Kent Early
Purch Agt-Asst to Pres:

Hugh B Andrews, Jr
BAKER MOUNTAIN MINE,
Cullen, open pit, Kyanite

WILLS MOUNTAIN MINE,
Dillwyn, open pit, Kyanite

Gen Mgr: Gene Dixon
Asst Gen Mgr: Hugh B Andrews,
Jr

FLOT MILL, Processing &
Storage Plant, Pamplin

METAL & THERMIT

CORP
100 Park Ave, New York, N Y

Pres: H E Martin
HANOVER PLANT, Rt 3,
Beaverdam, open pit, Rutile,
limonite

Gen Mgr: K E Duod
Gen Supt: C M Goin

Prod: 800 tons per day
(See N Y)

NATIONAL GYPSUM CO

Kimballton
MINE & PLANT, undergr,
limonite

Mine Eng: J R Grubb
Plant Mgr: Moore Rule

Mine Supt: R G McDonald
Prod: 1000 tons
(See Ind, Iowa, Kans, N Y,
Tex)

NEW JERSEY ZINC CO

Austintille
BERTHA MINERAL DIV MINE,
Zn, Pb

Mine Supt: K R Winslow
2,000-TON FLOT MILL

Supt: W L Albers
(See Colo, Ill, N J, N Mex, N Y,
Pa, Tenn, W Va)

REYNOLDS MINING

CORP
Reynolds Metal Bldg,
Richmond

Pres: Walter L Rice
VP: R H Zeglin, J Louis

Reynolds
VP & Treas: C E Coghill

Sec: Allyn Dillard
Ch Geol: John D Moses

Safety Eng: J E Nichols
Purch Agt: M W Henry
(See Ark, Colo)

RIVERTON LIME & STONE CO

Riverton
Pres: J C Holm

DOMINION MINERALS DIV
MINE, Piney River

open pit, apatite rock
Plant Mgr: W K Rodenhough

MILL, Piney River

TRI-STATE ZINC INC

123 William St,
New York 38, New York

Pres: R F Playter
VP: V C Allen

WASHINGTON

AMERICAN SILVER MNG CO

123 W 4th Ave, Spokane
Pres & VP: J M Henneke
Sec & Treas: L B Conrad
(See Idaho)

AMERICAN SMLT & REF CO

Box 60, Colville
NORTHPORT UNIT, surface,
Zn, Pb
Supt: P A Lewis
Frm: Frank Paparich
Acct: Fred Harding
Prod: 1,000 tons
1,000-TON FLOT MILL
Plant idle
TACOMA SMELTER, Box 1600,
Tacoma, Copper smelter,
Electrolytic refinery, arsenic
refinery & acid plant
Mgr: R E Shinkovkey
Asst Mgr: G E Sigler
Gen Supt: C R Low
Purch Agt: J F Vogel
(See Ariz, Calif, Colo, Idaho,
Ill, Md, Mont, Neb, N J, N Mex,
N Y, Tex, Utah, Wash & Federal
Mng & Smelting Co, Mo)

AMERICAN ZINC, LEAD & SMELTING CO

827 Old Nat'l Bank Bldg,
Spokane
Western Mgr: R E Calhoun
Purch Agt: R F Tharp
GRANDVIEW MINE, Metaline
Falls, undergr, Zn, Pb
Res Mgr: John W Currie
Mine Supt: Otis M Hagberg
Assay: F H Shellenberger
Mine Frm: C L Sage
Mine Eng: R J Lampton
Prod: 850 tons
750-TON FLOT MILL
Mill Supt: D A Underwood
(See Ariz, Ill, Mo, Ohio, Okla,
Tenn, Tex, Wis)

B B B & M MNG CO

2433 W LaCrosse, Spokane 13
Pres: Otto L Bagdon
VP: Carl W Martinson
Sec-Treas: Kenneth R Bagdon
(See Idaho)

BASIC MINERALS LTD

Aladdin Rt, Colville
LAST CHANCE CONSOL MINE,
North Port, undergr, Stevens
County, Pb, Zn
Mgr: Irvin Bennett
Idle
100-TON FLOT MILL, 6 mi
from North Port
Mill Supt: Irvin Bennett

BEAR CREEK URANIUM EXPL

Rhame, N Dak
MINE, in Washington, U₃O₈

BIG SMOKE URANIUM, INC

725 Paulsen Bldg, Spokane 1
Pres: Win O Kumbura
VP: Eugene A Kumbura
Sec & Treas: Martha Diehm
BIG SMOKE MINE, Spokane
Indian Reservation, open pit,
U₃O₈
Geol: Kenneth Russell
Under devel

BLUE BONNETT COMPANY

910 S 30th Ave, Yakima
Pres: Riley Williams
VP: Fred C Williams
Sec-Treas: Ora A Williams
BLUE BONNETT MINE, Roslyn,
undergr & surface, Cu, Ag, Au,
Co, Ni, Sphertine formation
Asbestos
Mine Supt: Riley Williams
Under devel
MILL, Camp Creek

BOAZ MNG CO

708 Joshua Green Bldg,
Seattle 1
Supt: Ivan R Maxfield
BUFFALO MINE, Grant County,
Granite dist, Ore
Au, Ag, Cu, Pb, undergr
Mgr: J P Jackson
FLOT MILL
(See Oreg)

BUNKER HILL CO, THE

The Bunker Hill Bldg,
860 Market St, San Francisco
4, California
Pres: John D Bradley
VP: Emmett G Solomon,
W G Woolf, D L Featheres,
R H Cutting, H E Lee
Sec: D L Featheres
Treas: Emmett G Solomon
Purch Agt: Gil Mayes, Kellogg,
Idaho

BONANZA MINE, Colville, Pb, Ag

Under devel
FABRICATION PLANT &
SECONDARY LEAD SMELTER,
2700 18th Ave, SE, Seattle 4,
Wash
Prod Mgr: Alvin Kroll
VP, Sales & Fabrication:
Roger H Cutting
(See Calif, Idaho)

CAMBRIAN MINING CO

526-27 Hutton Bldg, Spokane
Pres: Lloyd E Sherrill
VP: Theodore Kary
Sec-Treas: Kenneth R Bagdon
PROSPECTS, Stevens & Pend
Oreille Counties, open pit,
U₃O₈, Pb, Cu, Zn, WO₃
Under devel

CLEAR WATER MINES, INC

401 Empire State Bldg,
Spokane 1
Pres: H G Loop
VP: John Healy
Sec-Treas: E I Fisher
Purch Agt: John Healy

DAY BREAK URANIUM, INC

12707 Valleyway, Opportunity
Pres: James W Fox
VP: A Alvenses
Sec-Treas: Kae H Sowers
DAY BREAK MINE, open pit,
stonite, uraninite, coffinite
Mine Supt: E A Collins
Geol: H W Norman
Met: J Fred Williams, Jr
Prod: 100 tons
Under devel

DAWN MNG CO

Furd
Pres: G S Hipsdale
MIDNITE MINE, Stevens
County, U₃O₈, open pit
Mgr: J J Crowhurst
Geol: James W Wilson
Mine Supt: Pet Lpacer
Mine Eng: Keith Payne
Prod: 440 tons per day
440-TON MILL, Ford
Mill Supt: Paul E Stucker
Mill Frm: W H Darlington
Assayer: Lloyd Workman
(See Newmont Mng Corp, NY)

DAWN URANIUM & OIL CO

422 Paulsen Bldg, Spokane
Pres: Gaylen Jones
VP: Charles Wieser
Sec-Treas: C R Echlin
SMITH, WILSEMORE LEASE,
& CURTIN FARM MINE,
Spokane County, U₃O₈
Under devel

DEER LAKE TUNGSTEN MINE

Box 344, Deer Park
Mgr: W H West
MINE, Blue Grouse Mt,
undergr, surface, WO₃
Idle
25-TON GRAV MILL

DELMAR MNG & MLO CO

N 5018 Lincoln,
Spokane 19
Pres: Norman E Mills
VP: Adolph Okerst
Sec: Harry O Klaus
(See Idaho)

DEVIL'S CANYON MNG CO, INC

801 Central Bldg, Seattle 4
Pres & Gen Mgr: Vernon M
Osterberg
VP: W D Gotham
Sec: Ragni B Osterberg
Treas: Dr G M Osterberg
DEVIL'S CANYON MINE, Buena
Vista Mng dist, King County,
undergr & open pit, Cu,
Mo, WO₃, Ag
Under devel

FORD ROCK MNG CO

Box 382, Post Falls, Idaho
MINE, Ferry County, undergr
(See Idaho)

GENERAL MINES CORP

401 Empire State Bldg,
Spokane 1
Pres: H G Loop
VP: Chris Robolt
Sec-Treas: E I Fisher
Purch Agt: Harry Linden
GENERAL MINES, undergr
Gen Mgr: H G Loop
Mine Supt: Norman Ross
Asst Supt: Joe Hollingsworth
Under devel

GERMANIA CONSOL MINES, INC

401 Empire State Bldg,
Spokane 1
Pres & Gen Mgr: Henry J Frans
VP: H G Loop
Sec-Treas: E I Fisher
GERMANIA CONSOL MINE,
Hunters, undergr, WO₃,
U₃O₈
40-TON GRAV FLOT MILL,
Hunters
Idle

GOLD BOND MINING CO

300 Columbia Bldg, Spokane 4
Pres: Frank Lilly
MINE, Chelan County, Au, Ni
Under devel

GOLDBEL MNG CO

1112 N "K" St, Tacoma 3
Own: Ben E Lauck
SEPMAN MINE, undergr,
quicksilver
Mine Supt: Floyd Ray
Mine Eng: Matthew Madness
MILL & SMELTER, Morton
Assay: Galen Price

GOLDFIELD CONSOL MINES CO

Box 2550 or 208 N Virginia
St, Reno, Nevada
Res Mgr: T Higginbotham
ANDERSON MINE, Leadpoint
dist, Zn, Pb
Under devel

GRANDVIEW MINES

310-311 Radio Central Bldg,
Spokane 4
Pres: Karl W Jasper
VP: Paul Hoetsel
Sec: E K Barnes
GRANDVIEW MINE, Metaline,
Zn, Pb
Prod: 800 tons,
(Operated by American Zinc,
Lead & Smelting)

HERA EXPLOR CO

Box 8, Renton
Pres & Gen Mgr: W H Pillatos
VP: Dr W J Collins
Sec: George Ames
Met-Geol: J J Sherrard
HERA OR HIDDEN TREASURE
MINE, Wallace Creek Mng dist,
Mont, undergr, Au, Ag, Cu, Pb
Mine Frm: Sidney Ward
100-TON FLOT MILL, Wallace
Creek Mng dist
Mill Supt: J R Bartlett
(See Mont)

HIGHNOON URANIUM MINES, INC

E 730 Walton Ave, Spokane
Pres: C N McJunkin
VP: Bill McClurg
Sec-Treas: Jean McClurg
HIGHNOON, R 2, Uak. Pend
Oreille County, undergr,
U₃O₈
MILL, Ford
Mgr: J J Crowhurst

ISBELL CONST CO

Box 2351, Reno, Nev
MIDNIGHT MINE, Spokane
Indian Reservation, U₃O₈
Supt: Johnny Ambersen
Eng: Luther Krupp
(contract mng for Dawn Mng
Co, P O Box 6, Wellpinit)
(See Ariz, Idaho, Nev, Utah)

KASLO MINES CORP

401 Empire State Bldg,
Spokane 1
Pres & Gen Mgr: H G Loop
VP & Asst Gen Mgr:
E D Thompson
Sec-Treas: E I Fisher
KASLO MINE, in Canada
(However, BC)

KLEINHANS, WM

Malco
LUCKY 21 MINE, Ferry County
Idle

KNOB HILL MINES, INC

208 Sansome St,
San Francisco, Calif
Pres: H N Kuechler, Jr
VP: A R Patterson
Sec: D D Farley
Treas: L E Hellar
KNOB HILL MINE, Republic,
undergr, Au, Ag
Mine Supt: J E Davis
Mine Frm: F E Jordan
Mine Eng: L R B Atwater, Jr
400-TON FLOT MILL,
Cyanidation of tailings
Mill Supt: Louis Lembeck
Mill Frm: R A Kelle
Mill Assay: A D Brenner

KROMONA CONSOL MINES INC

Lloyd Bldg, 6th & Stewart,
Seattle 1
Pres: Joe F Krom
VP: H P Nielsen
Sec-Treas: Harold Tiets
KROMONA MINE, Sultan, Cu,
Ag, Au, Mo, WO₃
Gen Mgr: Joe F Krom
Cons Eng: W A Richelson
100-TON FLOT MILL, at mine
Mill Supt: W H Marquette
Under devel

L & N MINING CO

1129-10th Ave N, Seattle 3
Pres & Gen Mgr: W J Logus
VP: V R Newbury
Sec-Treas: M A Logus
Geol: Forbes Robertson
(See Nev)

LA SOTA-JONES LEAD & ZINC CO

Metaline Falls
Pres: P LaSota
VP: Wm Jones
Sec: Dolly Ricker
LA SOTA JOKES MINES,
surface, Pb, Zn, Ag
Under devel

LITTLE KING TUNGSTEN MINE

Box 344, Deer Park
LITTLE KING TUNGSTEN
MINE, Blue Grouse Mt, WO₃
Mgr: W H West
Prod: 12-15 tons
25-TON GRAV MILL, at mine

LOVITT MNG CO, INC

Box 1688, Wenatchee
Pres: E H Lovitt
VP: Vere McDowell
Purch Agt: Leo McKee
GOLD KING MINE, 3 mi S of
Wenatchee, undergr, &
surface, Au, Ag, silica
Mine Supt: Oscar Thompson
Prod: 250 tons

MAGNETIC MINES, INC

1218 Castlerock Ave,
Wenatchee
KULZER MINE, Stevens
County, Pb

MARCEAR, TED & AL (LESSEES)

Idarad
ACE OF DIAMONDS MINE, Au
Under devel

MODERN MINES DEVEL CO

Yakima
Pres: L V Sigman
MINE, Little Mt, Big Horn
County, Wyo, undergr, U₃O₈
Oper Mgr: Buford Miles
(See Wyo)

MUDHOLE EXPLOR, INC

712 Hutton Bldg, Spokane 4
Pres & Gen Mgr: Adolph Nissen
VP: Ralph E Umbreit
Sec-Treas: Duane H Watters
EXPLORE, surface, U₃O₈
Under devel

NEVADA RAWHIDE MNG CO

114 College Ave, Cheney, Wash
Pres: Clarence Davis
VP: Cline E Tedrow
Sec: Arthur Colyar
Treas: Arthur Colyar
PYRMID MINE, Pb, Ag, Au
Gen Mgr: H M Erb
Geol: Cline E Tedrow
Elec Eng: Lyman Johnson
Under devel

35-TON FLOT MILL, Holy

Cross mng dist, Nev
Mill Supt-Mill Frm: H M Erb
Assayer: H M Stowel Co
(See Nev)

NEW YORK-ALASKA GOLD DREDGING CORP

1616 Smith Tower, Seattle,
Wash
Pres & Man Dir: J K Crowley
VP: G G King
Sec: Leise G Robbins
Treas: Fannie Barley
Purch Agt: L E Robbins
(See Alaska)

NORTH WESTERN MNG & EXPL CORP

8 SW 19th St, Seattle 66
Pres: Albert L Workman
VP: Lyman Battey
Sec-Treas: James E Williams
THIRD TERM MINE, Powell
County, Montana, undergr, Pb,
Cu, Au, Ag, Zn
Gen Supt: James E Williams
Under devel
CONSOLIDATED MINE, Emery
County, Utah, undergr, U₃O₈,
V₂O₅
Gen Supt: James E Williams
Idle
(See Utah, Montana)

NORTHWEST MAGNESITE CO

Chewelah
Pres: E A Garber
VP: C A Sargent
Sec-Treas: E R Wilker
Gen Mgr: H A Ziebell
Plant Supt: Barney Esdrice
Plant Eng: Clyde Holm
Purch Agt: L A Knight
RED MARBLE MINE, 20 mi
SE of Chewelah, surface,
magnesian
Mine Supt: Roger L Fish
Mine Frm: Lloyd King,
John Estes
Mine Eng: J Brammer
Prod: 3,000 tons
3,000-TON FLOT MILL &
HEAVY MEDIA
Mill Supt: T W Morton

NORTHWEST MINERALS INC

720 Peyton Bldg, Spokane 1
Pres: Forrest M Garrett
VP: H E Bealy
Sec-Treas: Don A Gillis
Purch Agt: Don A Gillis
WYNCOOP LEASE, Wellpinit,
undergr, U₃O₈
Cons Eng: Sam Richardson
Fid Geol: David M Berry
Explor
(See Idaho)

NORTHWESTERN MNG CO

P O Box 806, Des Moines
(See California)

OLYMPIC MANGANESE MNG CO

1129 10th Ave North,
Seattle 2
Pres & Gen Mgr: W J Logus
Sec-Treas: M A Logus
TUBAL-CAIN MINE, 18 mi W
of Quilcene, undergr, Mn
Idle

PEND OREILLE MINES & METALS CO

923 Old Nat'l Bank Bldg,
Spokane 1
Pres: Jens Jensen
VP: A W Witherspoon
VP: John D Bradley
Sec & Treas: A C Wimberly
Consultant: W L Zeigler
PEND OREILLE MINES, 3 mi
N of Metaline Falls, undergr,
Zn, Pb
Purch Agt: R G Walker
Mgr: L M Kinney
Supt: L G Billings
Frm: Craig Cody
Mine Eng: Paul McIlroy
Ch Eng & Geol: Roy A Anderson
Prod: 2,000 tons
2,400-TON FLOT MILL,
Hawalline Falls
Mill Supt: J C Crampton
Assayer: R W Townsend
Ch Elec: R A Skeman

SAGINAW GOLD & COPPER MINES, INC

500 Gladstone St,
Bellingham
Pres: Phil N Hutt

Wyoming

Sec-Treas: R L Averill
VP: Louis La Presler
SAGINAW MINE, Whitman
County, Co, Au, Ag
Under devel

SHERMAN MNG CO
Rt 1, Box 245, Omaha
Pres-Purch Agt: C C Sherman
VP: W E Sherman
Sec-Treas: Theo H Hohn
SHERMAN MINE, 3 mi W of
Omaha, on Hwy 84, Ag, Pb,
Zn, Au, Mn, undergr
Gen Mgr: C C Sherman
W E Sherman, Theo H Hohn
Geol: F B Satterlee
Mech Eng: W E Sherman
60-TON FLOT GRAY MILL, at
mine
Under devel

SILVER BUCKLE MNG CO
Box 1088, Wallace, Idaho
BOYD LEASE, Stevens County
Idaho
PETER'S LEASE, Stevens
County
(See Idaho, Utah)

SPOKANE-IDAHO MNG CO
811 Peyton Bldg, Spokane 1
Pres: Frank N Marr
Sec: C D Randall
Treas: Charles E Marr, Jr
(See Idaho)

SUNNY PEAK MNG CO
401 Empire State Bldg,
Spokane 1
Pres: C J Weller
VP: A T Fleming
Sec-Treas: E I Fisher
MOHAWK, MINERAL HILL
GROUP, BURSER GROUP,
Concomity, undergr,
Under devel
Gen Mgr: C J Weller

SUNSET MINES, INC
P O Box 9357, 1400 W 52nd
St, Seattle 7
SUNSET MINE, Shoshone County
Idaho, undergr
(See Idaho)

SUNSHINE MNG CO
738 Peyton Bldg, Spokane 1
Pres: Robert M Hardy, Jr
VP: C M Hall
Sec: Stanton B Bennett
Treas: Vincent P Whelan
Gen Mgr, Mng Div: John Edgar
Gen Mgr, Petroleum Div:
A F Wynn
(See Idaho, Utah, Ariz)

TREASUREMENT MNG CO
1129 10th Ave N, Seattle
Pres & Gen Mgr: W J Logus
Sec & Treas: M A Logus
(See Idaho)

TRINTON MNG CO
155 S Main St, Colville
LUCKY SUNDAY GRP, Ferry
County, undergr

UNITED IDAHO MNG CO
c/o Roger Pierce,
Salt Lake City
MAJOR BUDD MINE, Rampart
Mt dist, near Butte, Mont,
Au, Ag, Pb, Cu
(See also P K F M & B CO,
Mont)

UTAHCAN INC
1931 E Sprague Ave,
Spokane 31
Pres: L L Loring
VP: Gordon Berkhug
Sec-Treas: Wm Rieley
UTAHCAN MINE, Inoe, Pb, Zn,
Ag, Au, open pit
Under devel

WAR EAGLE MNG CO, INC
P O Box 1043, Yakima
Pres: Russell E Peterson
VP: Virgil L Packer
Sec-Treas: E Walter Peterson
Purch Agt: E W Peterson
11 CLAIMS, Copper Creek Mng
dist, Yakima County, Mo
Under devel
(See Idaho)

WASHINGTON MINING CORPORATION
Box 98, Palmer
Pres: J A Koller
VP: Laurence V Berkshire

Sec: Ronald E Ljungdahl
Treas: H B Beasling, Jr
**ROYAL REWARD & CARDINAL
REWARD MINES,** Cumberland,
undergr, Hg
Gen Mgr: L V Berkshire
Gen Supt: R E Ljungdahl
Geol: L V Berkshire
Prod: 25 tons
25-TON MULTIPLE HEARTH
FURNACE, Cumberland
Mill Frm: J A Crawford

WERDENHOPF MNG CO
1086 1/2 S 11th St, Tacoma
MOTHER LODGE, Crook County,
Oregon, Hg
(See Oregon)

WESTERN GOLD MNG INC
718 Vance Bldg, Seattle 1
Pres-Purch Agt: Harry P
Kramer

VP: M S Alexander
Sec-Treas: George D Bender
MINE, Winthrop, undergr, Au,
Ag
Under devel

WESTERN RESOURCES CORP
P O Box 588, First & Main,
Los Alamos, Calif
LYONS HILL SILICA DEPOSIT,
9 mi from Springdale, silica
Under devel
(Mine is operated by contract)

WESTERN URANIUM MINES, INC
730 Peyton Bldg, Spokane 1
Pres: William Winkler
VP: Abner M Ingberston
Sec & Gen Mgr: Don A Gillis
Treas: E J Minnigh
Consult Eng: Sam H Richardson
SHERWOOD LEASES, Wellpoint,
Spokane Indian Reservation,
open pit, U₃O₈
SNEVA LEASE, Milan, (Id)
Spokane
WILLMORE LEASE, Wellpoint,
U₃O₈
Explor

WHITEDELF MNG & DEVEL CO
401 Empire State Bldg,
Spokane 1
Pres-Purch Agt:
Compton I White
VP: H O Loop
Sec-Treas: E I Fisher
WHITEDELF MINE, Clark
Fork, Idaho, Pb, Ag, Zn
Gen Mgr-Mine Supt:
Compton I White
100-TON MILL, Clark Fork
(See Idaho)

WIND RIVER MNG CO
103 West 11th St, Vancouver
Pres: Everett N Philpott
VP-Purch Agt: George E
Philpott
Sec-Treas: Kent M Nielson
WIND RIVER MINE, Skamania
County, undergr, Au, Ag
Gen Mgr: Everett N Philpott
Geol: David E Loughran

WEST VIRGINIA

MEADOWBROOK CORP
Spelter
Pres: H D Carus
VP: H A Gronemeyer,
A C Carus
Sec-Treas: C R MacBryne
Purch Agt: T S Stuart
RETORT SMELTER, Spelter
Works Mgr: T R Ferguson
Prod: 40,000 tons slab Zn
yearly

WISCONSIN

AMERICAN ZINC, LEAD & SMELTING CO
1919 Paul Brown Bldg,
St Louis 1, Mo
VINEGAR HILL DIVISION MINE,
Shullsburg, undergr, Zn, Pb
Ida
(See Ariz, Ill, Mo, Ohio, Okla,
Tenn, Tex, Wash)

CUBA MNG CO
118 S Court St, Plattville
Mgr: J P Lash
Sec: H M Hoffman
Treas & Purch Agt: A W Helms
PIERSON MINE, Mineral Point,
undergr, Zn, Pb (subleased to
Ivey Construction Co)
Mgr: Roger Ivey
TEASDALE MINE, Benton,
undergr, Zn, Pb (subleased to
New Teasdale Mng Co)
Mgr: John Cherry
Ida

EAGLE PITCHER CO, THE MNG & SMELTING DIV
Galena, Ill
Gen Mgr: R L Hoffman
Gen Supt: H H Haman
Geol: Wm Arnold
Maint Supt: Tom Ray
Maint Frm: Clarence Lyden
Mine Supt: E L Hovy
Mill Supt: C C Crow
SHULSBURG MINE & MILL,
Shullsburg, Zn, Pb
Prod: 1,200 tons
DINKET MINE, Hazel Green,
Zn
Prod: 500 tons
LINDEN MINE, Linden, Zn
Prod: 300 tons
LINDEN MILL, Linden
(See Ill, Kans, Nev, Ohio, Okla)

MONTREAL MNG CO
Montreal
Gen Supt: C A Bjork
Supt: D S Young
Asst Supt: R H Holgers
Purch Agt: C F Guntner
Master Mech: Leo R Arduant
Elec Eng: James Thomas
Mech Eng: W W Viebahn
MONTREAL MINE, 4 mi W of
Hurley, undergr, Fe
Prod: 3,850 tons daily
(See Ogishay-Norton & Co, Ohio)

NEW JERSEY ZINC CO, THE
Box 217, Plattville
EXPLORATION STAFF
Res Geol: J M Hague
Geol: Wayne Zwischy
(See Colo, N J, N Mex, N Y,
Pa, Tenn, Va)

PICKARDS MATH & CO OLANAH IRON CO
Duluth, Minn
CARY MINE, Hurley, undergr
Supt: Russell L Jose
Asst Supt: B W Carey
(See Mich, Minn)

WYOMING

ADAMS, R W
c/o Western Nuclear, Rawlins
MINE, U₃O₈

ALJOE MNG CO
Thermopolis
HOLDINGS, Gas Hills area,
Fremont County, U₃O₈

AMERICAN COLLOID CO
5100 Safford Court, Skokie,
Illinois
Pres: Paul Bechtner
VP: William D Weaver
Asst Sec-Treas: Jeannette Dixon
Purch Agt: Arthur G Clem
UPTON MINE, Upton, open
pit, bentonite clay
Gen Mgr: Orville Horn
Asst Gen Mgr: Donald Horn
Prod: 250 tons
250-TON MILL, Upton, drying
and grinding
(See Ill, Miss, S D)

ANSCHUTZ DRILLING CO, INC
1411 Mile High Center Bldg,
Denver, Colo
FLY GROUP, Converse County,
undergr, open pit, U₃O₈
(See Colo, Utah)

ATLANTIC WESTERN MNG CO
South Pass Route, Lander
DUNCAN MINE, undergr, Au
80-TON FLOT MILL
Under devel

B & H MINES
Rt 2, Douglas
MINE, U₃O₈
BALBOA MNG & DEVEL CO
Moorecroft
LAYMON LEASE, 20 mi N of
Moorecroft, U₃O₈
Explor

BARCO MINERALS INC
Box 422, Sturgis,
South Dakota
Pres: Richard B Williams
VP: M H Braden
Sec-Treas: Rud I Williams
SPOOKY JOE, Hallett, Crook
County, open pit, U₃O₈
Mine Supt: M H Braden
Geol: W J Laug, FR Williams
Under devel

BASIN HGR CO
300 E. 8th, Riverton
MINE, U₃O₈

BENTON CLAY CO
P O Box 452, Casper
Pres: Fred Carr
VP & Gen Mgr: I Kreiner
Sec-Treas: Henry Burgess
BENTONITE MINE, Natrona
County, placer
Gen Supt: R E Goering
Geol: Fred Carr
Mech Eng: R E Goering
MILL, Casper

BLACK HILLS BENTONITE CO
Moorecroft
Pres: H T Thorson
Gen Mgr: A C Harding
MINE, Moorecroft & Upton,
surface, bentonite
Mine Supt: W A Robinson
Prod: 200 tons
180-TON MILL, drying &
grinding
Plant Supt: Boyd Ash

BLACK THUNDER MNG CO
801 So N Douglas
Part: Russel Twiford Jr,
Curtis Rochelle
Sec-Treas-Purch Agt:
R Twiford Jr
HARDY MINE, 48 mi N of
Douglas, Converse County,
U₃O₈, undergr
Gen Mgr: Russel Twiford Jr
Mine Supt: Clayton Duffy
Prod: 25 tons

BOWEN, N H
135 S La Salle St,
Chicago, Ill
HOMESTAKE MINE NO 1, 20 mi
N of Moorecroft, U₃O₈

CHORD URANIUM CO
Edgemont, S Dakota
GRIFFITH LEASE, 30 mi N of
Moorecroft, U₃O₈
(See S D)

COLORADO FUEL & IRON CORP
Sunrise
SUNRISE MINE, undergr, Fe
Supt: M L Sisson
Asst Supt: R L Wahl, Jr
Eng: H B Lynch
Ch Elec: R E Davis
Ch Chem: H A Rohb
Mine Frm: A E Testolin
Prod: 3,100 tons
(See Colo, Utah)

COLUMBUS MINE
P O Box 2164, Bell
Gardens, Calif
Own: Grace D Ball,
H W Dittmer
COLUMBUS MINE, Pumpkin
Butte, Gillette, open pit,
U₃O₈, V₂O₅
Ida

CONTINENTAL MATERIALS CORP
820 South 9th, Grand
Junction, Colo
MINE, Crooked Gap, open pit
& undergr, U₃O₈
Gen Supt: Herbert Reynolds
(See Colo, Utah)

COPPER KING MNG CO
Box 521, Cheyenne
Pres: Harry E Ferguson
VP: Andy E Roodol
Sec: P W Dimmeon
Treas: Harry E Ruckman
COPPER KING MINE, 22 mi W
of Cheyenne, open pit, Cu, Au,
Ag, Ti
Mine Eng: T L Johnston,
(Laramie)

Under devel
COWAN, J L
418 N 4th St, Douglas
MINE, U₃O₈

CRABTREE, JOHN M
Box 517, 410 S 4th, Douglas
MINE, U₃O₈

CRYSTAL CREEK GYPSUM CO
243 W Main St, Lovell
Pres: Alfred Deschenes
VP: Herbert Daniels
Sec-Treas: H M Deschenes
CRYSTAL CREEK GYPSUM MINE, Crystal Creek & Himes,
open pit, gypsum
Under devel

FEDERAL URANIUM CORP
1370 S 3rd West,
Salt Lake City, Utah
Pres: R W Neyman
VP: L S Harrison
Sec-Treas: D V Peters
Purch Agt: J A Grice
MINE, Gas Hills, open pit,
U₃O₈
Under devel
Mine Supt: L R Messerly
Chief Eng & Geol: R G Lindorf
Prod: 600 tons daily
500-TON INFILCO RIP MILL,
Gas Hills, U₃O₈
Mill Supt: A W Griffith

FOSTER & NADING
Casper
MINE, U₃O₈
FOUR CORNERS URANIUM CO
220 Mile High Center,
Denver, Colo
VP: Dr E L Clark
MINE, Gas Hills, U₃O₈
(See Colo, Utah & Large
Uranium Corp, N Mex)

FREMONT MINERALS, INC
Farmers Union Bldg,
Denver, Colo
550-TON MILL, U₃O₈
Mill Supt: G H Bryant
Prod Frm: P V Bethurum
Plant Eng: R F Stoker
(See Colo)

GENEVA URANIUM CORP
Riverton
Pres: W Lamont Roberts
VP: Charles M Massey
Sec: Geneva L Roberts
SHELLEY MINE, Copper
Mt area, U₃O₈
Gen Mgr: W Lamont Roberts
Operators: Don Fitzhugh & Weber
Prod: 50 tons/month

GILBERT, M C
Box 711, Casper
JOYCE MINE, Pumpkin Butte,
surface, U₃O₈

GLOBE MNG CO
(Unit of Union Carbide Corp)
Box 1048, Grand Junction,
Colo
GLOBE MINE, Riverton,
Converse County, open pit,
U₃O₈
Gen Mgr: J L Lake
Mgr of Plants: J F Brenton
Plant Supt: K W Lents
Mine Supt: Robert Taylor
(See Colo)

GREEN RIVER OIL & URANIUM CO
26 W Broadway #1,
Salt Lake City, Utah
Pres: Falias M Kelly
Sec-Treas-Purch Agt:
Austin B Smith
VANADIUM QUEEN PROPERTIES, San Miguel
County, Colo
HAL, BART, EAGLE, SKOAL
GROUP, Gas Hills area,

Freemont county
VANADIUM QUEEN MINE, Gas
Hills area, open pit, undergr
(Leased to Ed Hall, Grand
Junction, Colo Mng oper by
Lucy Mc Uranium)
(See Colo, Utah)

HAMLIN EXPLOR & MNG CO

Gillette Rt, Midwest
Pres: William C Hamlin
Sec-Treas: Clyde H Hamlin
HAMLIN-BUTTES #1 MINE,
8 mi SE of Lynch, Johnson
County, open pit, U₃O₈
Mine Supt: William C Hamlin
Prod: 3500 tons per year
HAMLIN-TURNERCREST
#1 MINE, 5 mi S of
Turnercrest, Converse County,
open pit, U₃O₈
Mine Supt: William C Hamlin
Prod: 7 tons per day
(See Calif)

HOMESTEAK MINING CO

100 Bush St, San Francisco 4
California
HAUBER MINE, Hulett, U₃O₈
Mine Supt: C N Kravig
Asst Mine Supt: W C Campbell
Mine Frm: Norman Spilde
Under devel
(See Calif, N Mex, S D, Utah)
GREEN MT URANIUM
CORP (SUBSID OF
PHELPS DODGE CORP)
Lander, Wyo
Mgr: Elton Clark
MINE, Crooks Gap, U₃O₈
(See Phelps Dodge Corp, Ariz,
N Y)

INTERMOUNTAIN CHEMICAL CO, WESTVACO CHLOR- ALKALI DIVISION OF FOOD MACHINERY & CHEM CORP)

Box 872, Green River
Div Mgr: R J DeLargey
Purch Agt: R T Guest
WESTVACO MINE, undergr,
trans
Gen Mgr: R A Bondurant, Jr
Asst to Gen Mgr: E L Stout
Gen Supt: R F Love
Geol: L K Norseth
Mech Eng: H F Young
Elec Eng: L Ruffini
Asst to Gen Mgr: W C Bauer
Mine Supt: T S Bernatis
Mine Frm: W F Peters
Mine Eng: W Z Wenneborg
2000-TON MILL, at mine
solution & recrystallization
Mill Supt: R Kridahl
Mill Frm: R Bruce
(See Barium Prod, Ltd., Calif,
Nev & Food Machin & Chem
Corp, Calif, N Mex)

INTERNAT'L MINERALS & CHEM CORP, EASTERN CLAY PRODUCTS DIV

Box 451, Belle Fourche
S Dakota
MINE, Crook County, surface,
benzonite
Mgr & Purch Agt: K L Arthur
MILL, Belle Fourche, S Dakota
(See Ariz, Colo, Fla, Ill, Maine,
Miss, N Mex, N C, S Dak, Tenn,
Va)

JEPSEN, C M

P O Box 41, Gillette
MINE, U₃O₈

KAYE MINERAL INC

Suite 314,
Centennial Bldg, 1645 Court
Place, Denver 2, Colorado
DUBOIS URANIUM I-6, Dakota
U₃O₈
Idle during winter

KERR MCGEE OIL INDUSTRIES

Kerr McGee Bldg,
Oklahoma City, Okla
Casper Office, Midwest Bldg,
P O Box 219
URANIUM prod
Dist Geol: F A Groth
Landman: Dale Trubey
(See Ariz, Colo, N Mex)

LEBORN OIL & URANIUM CO

Riverton
Pres: Charles M Massey
MINE, Copper Mt area
Under devel

LEVI, DALE B. COMPANY

1450 York St,
Denver, Colorado
DALE B MINE, Gas Hills, open
pit, U₃O₈
Gen Mgr & Geol: John R Lewis
Mine Frm: Russell S Stewart
Prod: 100 tons per day

LISBON URANIUM CORP

304 1st Security Bldg,
Salt Lake City, Utah
Pres: A P Kibbe
VP: Eric C Ryberg
Sec: Max B Lewis
Treas: Glen L Davis
FEUSNER MINE, Box 987,
Lovell, U₃O₈, undergr,
Mgr: R L Christie
Geol: James R Andrus
Prod: 25 tons per day
SAMSON MINE, Gas Hills
dist, undergr, U₃O₈
Geol: G W Forrester
Dist Supt: K A Nobs
Mine Supt: John Russel
Under devel
(See Colo, Mont, N Mex, Utah)

LITTLE GIANT URAN CORP

c/o Tom S Davis, Box 3246,
Casper
MINE, U₃O₈

LITTLE MISSOURI MNG INC

Moorestown
MYERS STORM LEASES,
near Sundance & Moorcroft
U₃O₈

LOGAN CHURCHILL & GARDNER

1202 5th St, Fairbury, Nev
MINE, in Wyo, U₃O₈

LOMA URANIUM CORP

316 Paramount Bldg,
Denver, Colo
MINE, Converse County, open
pit, U₃O₈
(See Colo)

LUCKY Mc URANIUM CORP

807 Walker Bank Bldg,
Salt Lake City, Utah
Pres: Allen D Christensen
Exec VP: E E Littlefield
VP: Neil McNeice
Sec: Robert Cranmer
Treas: J M Horrigan
LUCKY MC MINE, Masonic
Temple Bldg, Riverton, 50 mi
E of Riverton, Gas Hills mag
dist, open pit, U₃O₈
Gen Mgr: A V Quinn
Proj Mgr: J S Anderson
Asst Proj Mgr: Merton Pratt
Mine Supt: S A Hottman
Mech Supt: Rusty McClure
Maint Supt: Arthur Gaines
Mng Eng: John Atkins
Met: Joe Pimental
Cons Met: Robert Porter
Ch Chem: Harold Pitts
Prod: 1000 tons per day
750-TON MILL, Gas Hills
field column exchange
Mill Supt: Ian Ritchie
(operated by Utah Mng Co,
& Utah Devel Co)

MAGNET COVE BARIUM CORP

Box 832, Greybull
Div Mgr: Lee Greiner
MINE, 8 mi E of Greybull,
surface, bentonite
250-TON MILL, drying &
grinding
Mill Supt: John M Copenhaver
(See Ark, Fla, Mo, Nev, Tex)

MAGNETITE PROD CORP

Wheatland
Sec-Treas: Part Merriman
MINE, Albany County, open
pit, Fe

MARLOCK MNG CORP

311 E Sunset Dr, Riverton
Pres: E L Lockhart
VP: Marion Lockhart
Sec: Donald Spiker
ML-634 MINE, Dry Fork area,
N Douglas, undergr, open pit,
U₃O₈
Gen Mgr: E L Lockhart
Asst Gen Mgr: Paul Handford
Gen Supt: John Hemming
Undergr Supt: George McKelish
Mine Supt: E L Lockhart
Prod: 50 tons

MODERN MINES DEVEL CO

Yakima, Wash
Pres: L V Sigan
MINE, Little Mt, Big Horn
County, undergr, U₃O₈
Oper Mgr: Buford Miles
(See Wash)

MOORE, GEORGE R

c/o Wendell J Schlausman,
Savageton, Rt 1, Gillette
MINE, U₃O₈

NATIONAL LEAD CO, BAROID DIVISION

Box 1875, Houston 1, Texas
CLAY SPUR MINE, Box 123,
Osgood, open pit, bentonite
Gen Supt: J B Lott
DRY GRINDING MILL
(See Ark, Calif, Colo, La, Mo,
Mont, N Y, Tenn, Tex)

P C MNG CORP

P O Box 72, Schoenectady, N Y
MINE, Gas Hills, Fremont
County, open pit, U₃O₈
(See N Y)

PETERSON, RICHARD L

Box 8, Douglas
Part: Bruce Anderson
CERESITE #1 MINE, Douglas,
undergr, Muscovite
Mine Supt & Geol: Warren Ove
Under devel
ZEE MINE, undergr, open pit,
U₃O₈
(Contracted by Twiford Mng Co)
Under devel

QUAD URANIUM CO

Hulett
Own: James Sheffield, N C
McLane, Ted R Wagner
THE QUAD URANIUM MINE,
Hulett, open pit, U₃O₈
Prod: 200 tons per month

RAMSEY, WILLIAM F

Gillette
MINE, U₃O₈

RAN REX MNG CO

MINE, Gas Hills, Fremont
County, open pit, U₃O₈

ROCKY MOUNTAIN MILL & CHEM CO

1641 4th St, Box 187, Boulder,
Colo
MINE, U₃O₈

SAN FRANCISCO CHEMICAL CO

Drawer F, Montpelier, Idaho
LEEFE MINE, 2 mi NW of Sage
surface, phosphate
Mine Supt: Preston S Pugmire
Mine Frm: Frank Buck
Prod: 1,000 tons
(See Idaho, Utah)

SANTA RITA MNG CORP

P O Box 375, Lovell
MINE, U₃O₈

SHAWANO DEVEL CORP

1645 Court Place,
Denver 2, Colo
Pres: A K Swann
VP: Harry Blumkin, Karl S
Moras
Sec-Treas: J A Ekridge
MINE, Baggs, in Poison Basin
area W of Baggs, open pit,
U₃O₈
Gen Supt: Dean Pospital
MILL, Baggs
Mill Supt: T L McKinney

SHIRLEY BASIN DEVEL CO

Box 882, Casper
VP: F Coupey

SHONI URANIUM CORP

Box 488, Riverton
Pres: Vern Hughes
VP: Roy Peck
Sec-Treas: S E Clark
BONANZA MINE, Copper
Mountain, Fremont County
open pit, U₃O₈
Gen Mgr: Vern Hughes
Geol: Leigh Roush
Prod: 400 tons
Idle

SPERBERG, JOHN J

1412 11th Ave S,
Minneapolis 4, Minn
MINE, in Wyo, U₃O₈

SYL-DEL MINES INC

P O Box 802, Gillette
Pres: Steven D Schackel
VP: William F Ramsey
Sec-Treas: George Welbourn
SYL-DEL & MIRACLE MILE
MINES, Gillette, Pumpkin
Buttes, open pit, U₃O₈
Gen Mgr: William F Ramsey
Geol: Hal Shurley
Under devel
MINE, Gas Hills area, open
pit, U₃O₈
Prod: 20-3000 tons per month
MINE, Lusk, open pit, U₃O₈
Mine Supt: Chas Kelley
Mine Frm: Darryl Kelley
Mine Eng: Donnie Kelly

TRI STATE URANIUM MNG CORP

Pres: Charles M Massey
Sec: W H Patin
WASHKE MINE, Riverton,
U₃O₈
Prod: 5000 tms/yr

TRIPLE H & J MNG CO

P O Box 651, Rt 1, Astoria,
Oregon
MINE, U₃O₈

TWIFORD MNG CO

801 South 6th, Douglas
Pres: Russell Twiford
VP: Irving Twiford
Sec: Russell Twiford Jr
ZEE MINE, 48 mi N of
Douglas, undergr, U₃O₈
Gen Mgr: Russell Twiford Jr
Mine Supt: Bernard Duffy
Prod: 25 tons per day

TWO STATES URANIUM CO

Beautiful
REDWOOD MINE, Gas Hills
area, open pit, U₃O₈
Gen Mgr: M B Fagan
Geol: Kenneth McGriffia
Prod: 1,500 tons per month
(Co-owner with Hughes Mng
Co)
(See Utah, Peterson, M F &
Lorena, Nev)

UNION CARBIDE NUCLEAR

P O Box 1169, Grand
Junction, Colorado
GLOBE MINE, Gas Hills,
Fremont County, open pit,
U₃O₈
(See Cal, Colo, N Y, Utah)

U S STEEL CORP, COLUMBIA-GENEVA STEEL DIV

120 Montgomery St,
San Francisco, Calif
EXPLOR, West Wyoming,
near Atlantic City
(See Alaska, Ala, Calif, Minn,
Pa, Tenn, Utah)

URANIUM CYCLE EXPL CO

Box 673,
Belle Fourche,
South Dakota
Pres: C Tenderholt
VP: Fred Hall
Sec: Lawrence Habuska
Treas-Purch Agt: W L Jallon
HILMER & YELLOW STUFF
MINE, Box 634, Aladdin, open

pit, U₃O₈
Mine Eng: A J Kajches
Prod: 25 tons
Under devel

VALLEY-DEAN CORP

Box 27, Bonifield, Utah
Pres: Merlin Holsh
VP: Arthur Seifert
Sec: Frank C Neilson
Treas: R N Schluter
REDWOOD MINE, Gas Hills
Gen Mgr: M B Fagan
(Co-own with Two States
Uranium Co)
Prod: 75 tons per day
(See Utah)

VITRO MINERALS CORP

(Subsidi of VITRO CORP OF
AMERICA-ROCHESTER-
PITTSBURGH COAL CO)

600 W 33rd St,
Salt Lake City, Utah
Pres & Gen Mgr: C J Potter
VP: W B Hall
Sec: W H Dennis, Jr
Treas: R T Ruder
Asst Gen Mgr: G H Young
Explor Mgr: C H Smith
WYOMING DIVISION MINE,
210 S Broadway, Riverton
Gas Hills, open pit, U₃O₈
Div Supt: Roy Coulson
Geol: R D Adamson
Ore Cont Eng: G Quigley
Mine Frm: Primo Calabria
Mine Eng: C J Whitley
Prod: 400 tons per day

WALKER, BURT

Lusk
MINE, U₃O₈

WALKER, RAYMOND

Ravillion Rt, Riverton
MINE, U₃O₈

WESTERN ENOR CORP

P O Box 8, Douglas
Pres & Geol: R L Peterson
VP: Bruce Anderson
Sec: B J Peterson
PROPERTIES, drilling & explor
(See Peterson & Anderson, Colo)

WESTERN NUCLEAR CORP

507 W Spruce St, Rawlins
Pres: Robert W Adams
VP-Treas: F O'Neil Griffin
Sec: Edward A Smyth
Cont: Roy J Jenkins
MINES, Jeffery City, Crooks
Gap & Gas Hills, open pits,
U₃O₈
Res Mgr: Joseph W Joyce
Mill Tech Supt:
Peter N Thomas
Mill Prod Supt:
Marville H Smith
Ch Geol: Eric Newman
Mng Eng: Don Conis
Mine Supt: Marcel Conis
Purch Agt: W L McFarland
Prod: 250 tons per day
1900-TON MILL, Jeffery City

WESTERN STANDARD URANIUM, INC

Box 489, Riverton
Pres: Vern Hughes
VP: Roy Peck
Sec-Treas: S E Clark
Gen Mgr: Vern Hughes
Geol: Leigh Roush
MINE, U₃O₈
Under devel

WHYNOT PROSPECTING CO

Wagner, S Dak
Pres: Dick Ninkhouse
Sec: D R Wipf
WHYNOT MINE, Gillette, open
pit
Gen Mgr: A R Morse

WYO-BEN PRODUCTS CO

Greybull
MINE, Bentonite, open pit,
grinding plant

WYOMING MINES & METALS

Box 284, Casper
MINE, U₃O₈

IRON ORE SHIPMENTS IN GROSS TONS FROM MINNESOTA, MICHIGAN, AND WISCONSIN BY COMPANIES AND MINES FOR 1956, 1957, AND 1958

Company Mine	1956	1957	1958	Company Mine	1956	1957	1958	Company Mine	1956	1957	1958
Charles Iron Mining Co.				Inland Steel Company				Hopewell	77,729	110,251	64,060
Charles Con-				Armour No. 1	166,702	173,915	171,105	Canton (St.			
centrator	108,607	—	—	Armour No. 2	116,485	108,915	145,299	James)	695,698	650,956	148,585
Cleveland-Cliffs Iron Co., The				Morris	302,710	295,654	335,197	Stephens	—	2,163,954	2,027,711
Athens-				Greenwood	63,241	40,756	83,188	Embarras	—	8,600	—
Bunker Hill	382,354	399,854	317,414	Sherwood	393,991	432,088	471,358	Total			
Cambria	—	—	33,385	Bristol	300,564	333,280	339,941	Shipments	29,069,894	33,473,559	18,239,011
Cambria-Jackson	221,031	176,667	—	Total				Oreclens Concentrator Corp.			
Cliffs Shaft	656,485	670,883	431,020	Shipments	1,343,693	1,434,108	1,548,088	Mine	—	—	1,100
Humboldt	212,487	179,185	108,912	Jackson Iron & Steel Co.				Pacific Isle Mining Company			
Lloyd	76,692	865	—	Bradley	34,110	26,074	15,800	Drew-Coxton-			
Mass	439,853	333,683	216,154	Jensie H Mining Co.				Syme	27,591	19,497	17,003
Mather	2,339,678	2,302,736	1,231,170	Jensie	—	—	121,902	Emmett	1,181	—	—
Ohio	122,401	116,701	81,079	James & Loughlin Steel Corporation				Genham No. 2	74,782	22,896	—
Tilden	164,883	192,373	—	Hill Annex	603,163	635,147	538,560	Uno-Kerr Group	157,085*	35,986	—
Spies	32,893	—	—	Hill Annex Rec-	—	—	—	Minabe Mountain	14,506	21,583	23,006
Agnew-Alworth	50,796	724	—	lamination Plant	—	147,756	132,230	North Shiras	5,401	—	—
Canisteo	993,816	467,297	562,485	Longyear	566,794	417,533	258,107	Wacoatah	153,397	97,396	80,464
Hawkins	800,242	668,667*	404,280*	Columbia	664,937	714,604	341,431	Pacific	—	39,753	65,969
Hill-Trumbull	534,924	690,858	33,281	Minabe Mountain	48,850	76,588	81,925	Alpema L.O.S.P.	7,721	16,733	31,752
Holman-Cliffs	956,648	912,243	809,646	Schley	215,133	80,323	198,280	Bradford	26,533	17,919	—
Sally	—	303,960	278,859	Pettit	262,219	549,375	282,802	Chatcaco	31,583	50,341	26,799
Sargent	102,393	76,625	—	Schley Group	—	—	—	Holland	74,740	14,495	—
Wanless	257,349	160,635	16,010	Stockpile	—	—	—	Mississippi	3,535	83,914	—
Marquette Ore	—	—	—	Tracy	—	—	—	Albany	—	2,335	—
Co. Pellets	35,000	226,335	318,361	Total				Wyoming	—	—	2,542
Research Lab.	—	—	—	Shipments	2,979,296	2,641,326	2,348,579	Emile	—	—	696
conc.	865	—	—	W. S. Moore Company				Commodore Group	—	148,172	127,219
Total	8,400,790	5,100,485	4,932,053	Margaret	4,758	20,455	—	Commodore-Union	—	—	—
Eric Mining Co.				Judson	258,034	38,459	5,668	Area	243,537*	—	—
Eric	227,994	243,172	2,491,482	Stubber	27,140	5,287	—	DM & IR L.O.S.P.	—	2,948	1,046
M. A. Hanna Company				Norman	1,307	13,141	42,807	Iroquois	—	274,595	266,960
Canon	327,487	731,903	610,358	Gilbert	—	2,422	—	Alpema	—	84,721	81,143
Hiawatha	542,187	641,531	425,918	Alice	23,116	30,015	—	Shads	—	20,892	—
Homer	433,354	522,842	376,083	Graff	2,967	3,991	—	St. Paul	218,212	126,201	61,378
Wauasca	803,716	594,936	370,106	Mariska	133,303	243,559	158,882	Genoa-Sparta	8,116	—	—
Bray	356,624	378,789	277,544	Judson Extension	—	96,744	14,376	Sidney	4,683	—	4,865
Gordon	640,296	611,483	532,773	Mariska Extension	—	5,349	—	Stevensen	14,452	24,975	—
Minabi Chief	234,367	—	—	Total				Susquehanna	—	—	—
Mississippi #3	—	129,521	297,701	Shipments	486,834	457,422	221,733	Retreat	12,748	—	—
Stein	101,662	332,347	—	North Range Mining Company				Victoria	—	26,605	—
Enterprise	1,061,892	728,037	455,067	Champion	137,447	172,029	123,973	Winifred	—	1,403	—
Brunt	15,323	2,835	948	Book	113,158	100,409	32,554	Winstar	—	5,380	—
Buckeye	50,034	71,871	—	Warner	166,234	160,251	69,535	Mangan	—	145,963	45,854
Norpsc	29,206	12,817	—	Leonidas	137,371	202,125	152,747	Zontelli Fee	—	—	134
Leach	—	333,725	84,911	Pemokee	511,287	514,059	103,178	Manuel-West	—	75,156	126,083
Douglas	172,453	123,771	13,297	Total	1,067,758	1,148,873	482,387	Alpmet	—	883	15,032
Duncan	232,685	336,060	66,103	Ogilby, Norton & Company				South Chandler	—	3,364	742
Argonne	—	39,431	260,891	Montreal	—	—	—	Wakefield	237,794	140,824	15,822
Perry	494,069	216,966	—	(Montreal	855,807	929,998	450,383	Merens	—	49,360	—
Carl's No. 2	33,643	—	—	Mng. Co.)	—	—	—	Total	1,317,637	1,564,211	1,000,264
Harrison	117,915	25,827	2,675	St. James	—	—	—	Pinkards Mather & Company			
North Harrison	84,276	6,209	—	(St. James	328,960	433,318	177,509	Zenith	353,784	384,924	170,046
Harrison E	127,701	114,144	—	Mng. Co.)	—	—	—	Embarras	672,383	726,603	426,242
Halobee	83,261	140,667	34,726	Canton	—	—	—	Albany	321,546	370,927	175,492
Quinn	30,611	23,900	22,717	(St. James	—	—	—	Scranton	329,031	439,095	301,721
Lot No. 1—				Mng. Co.)	—	—	—	Mahoning	1,805,109	1,774,937	651,510
Olson	496,319	172,334	272,962	Minings Co.)	—	—	—	Carmi	444,913	356,870	—
Wyman	185,487	64,446	—	Total	—	650,956	—	Bennett	493,175	468,322	—
Patrick Ann	635,565	691,708	622,066	Shipments	1,184,767	2,014,272	627,791	Danube	615,800	606,264	254,078
Patrick Annam	113,508	138,780	234,708	Oliver Iron Mining Division				West Hill	638,431	665,642	31,314
Kevin	76,926	47,578	41,513	Pioneer U. G.	798,223	766,077	747,997	Toga No. 2	564,517	742,499	674,691
Aromac	91,104	94,459	47,280	Soudan	308,809	157,405	161,392	Rabbitt Lake	301,508	303,437	—
MacKillican	488	—	—	Rouchleau	—	—	—	Mahnomen	343,753	401,013	189,341
Wegum Co.	326,648	366,710	280,474	Group (incl.	—	—	—	Sagamore	148,940	124,858	23,496
Longyear	—	34,770	20,148	Saunty)	—	7,234,225	3,053,829	Cary	547,525	603,206	416,788
South Agnew	744,716	669,999	123,692	Spruce Group	1,076,151	379,740	—	Newport	328,354	487,055	341,614
Agnew No. 2	440,220	404,162	233,845	Canton	1,224,085	651,746	—	Peteron	425,466	861,562	402,316
Morton	379,826	376,066	307,897	Pilotat	676,797	664,243	732,876	Genova	466,805	538,340	268,604
Felch	303,020	130,599	91,388	Gilbert	2,124,054	2,296,539	—	Anvil-Palma-	—	—	—
Huntington	34,453	6,718	13,606	Hull-Rust Group	3,282,332	2,502,034	896,912	Keweenaw	489,956	128,597	—
South Hillcrest	77,966	86,250	4,542	Sherman Group	5,727,793	5,951,165	3,281,798	Sunday Lake	282,493	439,114	265,308
Cayusa Fee	305,263	193,878	161,304	Monroe Group	2,287,916	3,147,100	2,386,603	Buck Unit	422,596	390,084	187,684
Section 6	—	11,102	34,359	Pillsbury	178,097	258,386	—	Fortune Lake	346,816	139,274	2,290
Louis No. 1	43,464	—	—	Kosmer Group	824,541	755,676	—	West Hill	35,305	19,901	—
Portsmouth	367,082	512,360	285,563	King Group	1,056,114	1,135,039	221,621	Toga No. 2	564,517	742,499	674,691
Spring Valley	275,376	300,579	175,944	Meadow Ext.	—	—	—	Rabbitt Lake	301,508	303,437	—
Alstead	88,440	111,237	49,297	(Pittsburgh	—	—	—	Mahnomen	343,753	401,013	189,341
Bowe	13,860	15,105	—	Pacific)	—	—	—	Sagamore	148,940	124,858	23,496
West Alpema	81,294	11,644	1,007	Pillsbury-Drews	—	—	—	Cary	547,525	603,206	416,788
Snyder	68,400	—	9,455	(Douglas)	26,806	25,067	—	Newport	328,354	487,055	341,614
Campbell D	27,802	10,728	18,618	Plummer	1,782,020	2,106,724	1,646,836	Peteron	425,466	861,562	402,316
Hunner	733,537	1,297,172	962,977	Morris Group	154,972	504,619	—	Genova	466,805	538,340	268,604
Hunt	345,256	362,802	76,880	Niles (Douglas)	58,503	64,250	—	Anvil-Palma-	—	—	—
South Edy	299,997	329,153	515,513	Arcturus Group	503,928	1,240,543	673,581	Keweenaw	489,956	128,597	—
Hunner	—	—	81,670	Mariska Extension	101,963	32,059	—	Sunday Lake	282,493	439,114	265,308
East Alpema	—	95,360	92,079	Leonidas Stockpile	334,467	341,089	—	Buck Unit	422,596	390,084	187,684
Gray Reserve	—	53,776	9,863	Union L. O.	—	—	—	Fortune Lake	346,816	139,274	2,290
Gray Annex	—	14,032	25,129	Stockpile	15,998	13,110	—	West Hill	35,305	19,901	—
Total	12,461,382	12,882,384	8,885,951	Total				Volunteer	128,210	88,891	41,741
Halcyon Young Mining Company & E. A. Young, Inc.				Hanna-Wacoatah				Lamberton Annex	6,858	—	—
Minnewas	71,758	59,822	29,323	"B" Stockpile	—	—	15,636	Lawrence	6,379	—	—
Elbera	122,876	86,196	57,125	Pillsbury-Drews	—	—	—	Total	11,165,267	11,066,587	4,819,285
Gnat	—	1,306	968	(Douglas)	26,806	25,067	—	Pioneer Mining Company			
Total	194,634	147,324	87,471	Plummer	1,782,020	2,106,724	1,646,836	Mary Ellen	—	—	—
				Morris Group	154,972	504,619	—	(Conc.)	315,940	151,605	67,698
				Niles (Douglas)	58,503	64,250	—	Republic Steel Corporation			
				Arcturus Group	503,928	1,240,543	673,581	Susquehanna	663,298	604,336	—
				Mariska Extension	101,963	32,059	—	Tahm Group	190,929	144,083	—
				Leonidas Stockpile	334,467	341,089	—	Total	854,227	748,421	—
				Union L. O.	—	—	—	Shipments	—	—	—
				Stockpile	15,998	13,110	—	Reserve Mining Company			
				Total				E. W. Davis	—	—	—
								Works Taconite Pellets	3,584,736	5,018,565	5,082,784
								Total	3,584,736	5,018,565	5,082,784

Company Mine	1956	1957	1958	Company Mine	1956	1957	1958	Company Mine	1956	1957	1958
Rhine & Fryberger Company				Brown			16,386	Snyder Mining Company			
Bonlog	344,655	268,363	165,512					Webb-Sellers	532,925	418,662	252,897
Troy	152,035	151,418	80,009	Total Shipments	584,592	820,365	537,404	Whitely	383,340	377,867	136,172
Pennington	3,264	30,843						Godfrey		226,776	156,359
Carlson-Nelson	37,739	69,741		Schroeder Mining Company				Total Shipments	916,265	1,023,305	610,543
Peasall			95,197	Krueger	74,000	81,540	65,115				

*Includes tonnage produced for others in trepan operations. 1. Includes 546 tons left in Upper

Lake port dock at close of 1956 season. 2. Does not include 1937-43,806 tons or 1938-50,541 tons

Harvester's Hawkins T. B. fines. 3. Armour No. 2 production isolated from Armour No. 1 shaft. 4. Estimated.

SHORT TONS OF ORE MINED AND SHORT TONS OF WASTE STRIPPED AT REPRESENTATIVE OPEN PIT MINES IN THE U.S. IN 1955, 1956, 1957 AND 1958

Mines	Company	1955		1956		1957		1958	
		Ore Mined	Waste Stripped	Ore Mined	Waste Stripped	Ore Mined	Waste Stripped	Ore Mined	Waste Stripped
Utah Copper	Kennecott Copper Corporation	27,740,600	45,710,091	32,321,100	30,657,533 ¹	30,919,900	32,300,817 ²	24,086,000	—
Peter Mitchell	Reserve Mining Company	—	—	—	—	15,512,487 ²	—	13,500,000	—
Marenci	Phelps Dodge Corporation	15,899,410	33,148,792	16,794,287	37,788,263	14,767,611	32,608,512	13,039,187	26,890,850
New Canelas	Phelps Dodge Corporation	10,274,836	14,663,772	10,112,434	14,504,201	8,813,134	14,014,755	7,711,440	13,691,784
Berkley Pit	Anascondia Company	911,279	2,132,000	2,132,000	15,402,000	4,891,805	18,197,614	6,923,272	11,721,470
Chino Mines	Kennecott	8,922,950	13,856,067	8,000,001	14,215,786	7,410,927	13,256,722	5,552,713	—
Highland	E. I. du Pont de Nemours & Co., Inc.	—	—	—	—	7,200,000	—	4,800,000	—
Trail Ridge	E. I. du Pont de Nemours & Co., Inc.	—	—	—	—	6,900,000	—	4,800,000	—
Mine	Inspiration Consolidated Copper Co.	—	—	—	—	4,456,378	8,151,872	4,621,091	5,462,587
Ray Pit	Kennecott Ray Mines, Div.	4,818,358	10,204,329	5,852,742	N.A.	4,991,608	11,038,562	4,436,292	9,912,120
Lavender Pit	Phelps Dodge	4,433,218	8,013,961	5,069,049	6,463,378	4,440,768	5,968,164	4,027,522	4,423,439
Yerington Mine	Anascondia Company	3,942,161	7,793,905	4,500,000	N.A.	4,004,413	5,491,522	3,976,425	4,035,150
Benson	Jones & Laughlin Steel Corp., New York Ore Div.	—	—	4,603,694	3,370,783	5,110,679 ⁴	4,177,580	3,064,544	3,636,487
Tenorec	Cornett Phosphate Co.	—	—	—	—	3,804,000	4,996,283	3,322,000	6,090,503 ⁵
Liberty	Kennecott Nevada Mines Division	474,096	613,377	2,369,114	719,378	2,710,093	1,177,977	3,013,234	8,384,545
Copper Cities	Miami Copper Company	4,004,052	3,347,720	4,187,147	3,869,131	3,482,482	3,037,708	2,768,390	2,103,268
Silver Bell	American Smelting & Refining Co.	—	—	2,738,450	8,771,600	2,832,600	3,141,480	2,748,600	3,342,080
Fairway #4	W. R. Grace & Co., Davison Chem. Div.	2,373,100 ⁶	2,308,400 ⁶	2,315,900 ⁶	2,683,000	1,979,800	3,219,600 ⁶	2,627,200	5,816,000 ⁶
Veteran	Kennecott Nevada Mines Division	75,157	1,050,467	709,136	10,607,335	10,400,322	10,400,322	2,369,614	2,508,335
Eagle Mountain	Kaiser Steel Corporation	2,032,636	3,079,282	2,649,892	4,108,568	2,635,000 ⁶	6,491,000	2,090,000 ⁶	7,323,000
Jacksonville	Humphreys Gold Corp.	2,700,000	—	2,920,000	—	2,440,000	—	1,867,000	—
Lone Star	Lone Star Steel Co.	—	—	—	—	3,266,378 ⁶	549,195 ¹	1,753,462 ⁶	260,339 ⁶
Bagdad	Bagdad Copper Corporation	1,544,489	9,175,745	1,361,870	5,909,888	1,479,034	3,743,300	1,663,614	6,343,233
Desert Mound	Columbia Iron Mining Co.	1,005,000 ⁶	1,054,000 ⁶	1,253,000 ⁶	995,000 ⁶	1,247,000 ⁶	1,327,000 ⁶	1,511,000 ⁶	1,367,000 ⁶
Bonny Lake	Davison Chemical Div.	1,393,600 ⁶	4,444,900 ⁶	1,398,300 ⁶	5,540,100	1,808,000	4,010,900 ⁶	1,222,600	2,734,500 ⁶
Pima	Pima Mining Company	—	624,000 ⁶	—	8,849,000 ⁶	1,094,359 ⁶	3,052,201 ⁶	1,098,742 ⁶	3,120,815 ⁶
Iron Mountain	Columbia Iron Mining Company	1,268,000 ⁶	951,000 ⁶	1,267,000 ⁶	911,000 ⁶	1,316,000 ⁶	1,401,000 ⁶	1,090,000 ⁶	1,186,000 ⁶
Nickel Mountain	Hanna Mining Co.	284,416	—	551,656	—	1,016,596	—	1,056,202	—
Gay	J. R. Simplot Company	791,961	223,678 ⁶	755,000	888,615 ⁶	482,648	1,321,850 ⁶	930,596	1,892,939 ⁶
Zenolite	Zenolite Co.	—	—	—	—	840,000	1,200,000 ⁶	900,000	1,740,000 ⁶
Saline County	Reynolds Mining Corporation	529,431	1,338,012	496,698	1,519,724 ⁴	155,230	789,021 ¹	575,189	753,675 ²
Lucky Mc	Lucky Mc Uranium Corp.	—	—	—	—	32,081	1,911,683	304,182	5,240,820
All Pits	Feldspar Corp.	—	—	—	—	275,405	—	262,711	—
Three Kids	Manganese, Inc.	393,088	729,420	455,852	3,368,851	38,545	96,399	206,436	1,587,523
Calumet	Calumet Mining Co.	—	—	—	—	30,935	2,317,185	158,033	1,756,784
Betty O'Neil	Basic Inc.	—	—	—	—	211,000	570,000 ⁶	155,000	114,000 ⁶
Anderson Pit	Montana Phosphate Products Company	—	—	116,038	491,403 ¹	117,000	340,000	117,000	350,000
Centennial	J. R. Simplot Company	—	—	86,909	179,740 ²	114,054	239,885	95,137	846,530
Iron Mountain	Mountain Copper Co. of California	—	—	—	—	93,000	760,000	92,000	888,000
Silica Products	J. R. Simplot	—	—	—	—	87,613	—	85,600	—
Rome	Summit Mining Co.	—	—	—	—	—	—	81,228	190,128
Day-Loma	Western Nuclear Corp.	—	—	—	—	—	—	—	64,775
Idaho-Almaden	Rare Metals Corporation of America	—	—	58,101	—	57,174 ⁴	—	61,073 ³	—
Tripp Pit	Kennecott Nevada Div.	—	—	—	—	—	—	42,109	—
Cameroon	Rare Metals Corp.	—	—	—	—	39,284	300,000 ⁶	31,041	600,000 ⁶
Bullrush	Western Nuclear Corp.	—	—	—	—	34,867	—	23,395	—
Whale	Ozark-Mahoning Company	—	—	104,737	—	91,462	—	15,514	—
Alice Pits	Anascondia Co.	—	—	—	—	95,540	43,038	11,279	1,833,389
Bonanza	Shovel Uranium Corp.	—	—	—	—	—	—	4,500	250,000 ⁶
Leviathan	Anascondia Co.	—	—	—	—	306,439	31,126	—	—
Vaa Stone	American Smelting & Refining Company	380,324	670,033	567,441	613,780	203,119	134,721	—	—
Sun Valley Barite	J. R. Simplot	—	—	16,377	30,900 ¹	48,937	44,412	—	—
Austin Bessan	Mineral Oil Co.	—	—	—	—	5,307	—	—	—
Kimberley	Kennecott Nevada Mines Division	N.A.	N.A.	1,368,143	—	3,379	86,339	—	—
Orange Park	American Cyanamid	—	—	—	—	—	521,195 ⁴	—	905,460 ⁶
Sydney	American Cyanamid Co.	—	—	—	—	—	709,236 ⁴	—	717,289 ⁴
Esperanza	Duval Sulphur & Potash Co. Copper Div.	—	—	—	—	—	410,342	—	4,917,331

1. Cubic yards. 2. Long tons. 3. Products sold. 4. Gross tons. 5. Stripping completed in October 1956. 6. Net tons. N.A. Not available. 7. Waste. 8. Wet.

SHORT TONS OF ORE MINED AT REPRESENTATIVE UNDERGROUND MINES IN THE UNITED STATES IN 1953, 1954, 1955, 1956, 1957 AND 1958

Mine	Company	1953	1954	1955	1956	1957	1958
SAN MANUEL CLIMAX	San Manuel Copper Co. Climax Molybdenum Co. Div. American Metal Climax, Inc.	—	—	459,726	5,496,328	8,823,130	11,486,300
SOUTHEAST MISSOURI BUTTE MINES	St. Joseph Lead Co. The Anaconda Co.	6,604,857 5,377,403	8,709,900 5,738,700	9,227,700 4,994,231	9,929,000 5,972,884	10,550,000 6,038,785	6,360,000 5,490,653
Copper ore		4,230,567	3,701,677	5,211,401	6,017,000	630,201	533,416
Kelley ore		—	—	—	—	4,325,263	3,034,952
Zinc ore		1,323,607	915,134	1,091,862	1,094,000	650,904	307,882
Manganese ore		471,642	370,288	388,500	420,074	430,906	338,290
Special Waste (Ca.)		—	—	—	—	131,288	27,018
TOTALS—The Anaconda Co.		6,025,816	4,987,099	6,691,873	7,481,000	6,168,362	4,261,684
MIAMI	Miami Copper Co.	—	—	—	—	3,455,120	1,870,865
HOMESTAKE	Homestake Mining Co.	1,368,059	1,485,226	1,550,116	1,627,719	1,657,703	1,725,081
CALUMET DIVISION	Calumet & Hecla, Inc.	2,009,262	1,939,329	1,406,671	2,060,849	1,731,385	1,598,173
CORNWALL	Bethlehem Cornwall Corp.	—	—	1,737,610 ¹	1,381,281 ¹	1,596,088 ¹	1,568,514 ¹
Tennessee Mines	American Zinc Co. of Tennessee	—	—	—	—	—	—
NO. 2		553,700	533,318	466,962	485,939	483,394	499,495
YOUNG		—	—	—	—	—	—
GRASSLETT		268,934	42,516	16,920	222,515	359,415	446,193
NORTH FRIENDS STATION		155,683	173,938	183,848	181,959	181,598	—
ATHLETIC		22,949	8,747	25,339	17,239	114,653	78,218
COY		—	—	—	—	21,395	31,353
TOTALS—American Zinc Co. of Tennessee		1,013,969	738,319	781,975	1,013,663	1,166,458	1,005,259
ILLINOIS-WISCONSIN	Eagle-Picher Co.	—	229,971	619,011	723,851	708,454	805,223
WYNE	Woodward Iron Co.	—	—	—	—	768,437	791,427
WESTVACO	Intermountain Chemical Co.	—	—	—	596,753	672,000	618,000
EAST SIDE	Pend Oreille Mine & Metals Co.	500,040	482,052	503,391	587,891	757,197	607,695
SUNRISE	Colorado Fuel & Iron Corp.	603,730 ⁴	492,304 ⁴	835,692 ⁴	725,498 ⁴	786,544 ⁴	558,544 ⁴
TRI-STATE	Eagle-Picher Co.	—	1,730,696	1,606,974	1,731,851	1,076,353	499,821
COPPER QUEEN-MEREE	Phelps Dodge Corp.	576,638	600,320	546,001	632,088	630,088	499,257
EALMAT	St. Joseph Lead Co., Edwards Div.	—	551,320	539,330	548,167	551,799	469,652
IRON MOUNTAIN	Oscar Ore Co.	—	—	—	—	438,335	422,725
MACMA	Magma Copper Co.	451,749	463,915	458,488	453,683	442,134	391,084
IDARADO	Idarado Mining Co.	260,200	267,250	274,350	480,000	437,850	382,100
SHULLSBURG	Eagle-Picher Co.	—	—	—	—	363,360	364,305
BUNKER HILL	Bunker Hill Co.	407,112	411,900	328,333	381,334	312,934	299,821
GRAHAM	Eagle-Picher Co.	—	—	—	—	200,000	207,427
GRAY MINE	Tri-State Zinc, Inc.	279,579	287,843	310,103	278,849	282,047	264,883
MOUAT	American Chrome Co.	—	—	—	243,346	251,323	250,166
DYSAERT #1	Rio de Oro Uranium Mines, Inc.	—	—	—	18,391	131,000	246,000
SUNSHINE	Sunshine Mining Co.	249,686	250,698	225,883	200,028	206,383	231,964
All Mines	American Zinc, Lead & Smelting Co.	—	—	—	—	—	—
GRANDVIEW		234,250	113,503	194,999	209,089	228,352	231,515
NELLIE B DIVISION		782,888	880,265	971,175	361,872	148,870	—
VINEGAR HILL DIVISION		—	—	45,912	145,231	91,252	—
PIQUETTE JOINT VENTURE		—	—	34,046	96,491	91,181	—
TOTALS—American Zinc, Lead & Smelting Co.		1,030,623	993,767	1,246,133	812,683	559,664	231,315
MADISON MINE	Nat'l Lead Co., St. Louis Smelting & Refining Div.	—	—	293,165	353,782	354,764	231,000
MINE LA MOTTE	St. Joseph Lead Co.	—	—	—	—	476,292	304,883
RED ORE	Tenn. Coal & Iron Div., U. S. Steel	—	3,394,693	3,528,193	—	3,235,365	2,031,143
STAR ²	Hecla Mining Co.	228,304	216,877	216,471	189,821	206,385	193,699
ANDERSON	Montana Phosphate Products Co.	—	325,000	294,971	170,689	172,000	185,000
MINES, ILLINOIS	Oscar-Mahoning Co.	—	—	130,324	179,472	156,869	139,246
ORE, KNOB	Appalachian Sulphides, Inc.	—	—	—	—	102,636	133,809
FAR WEST	Hidden Splendor Mining Co.	—	—	—	—	134,984	142,795
CALERA	Calera Mining Co.	64,574	137,875	176,977	275,724	231,624	138,470
CHAMPION	Copper Range Co.	—	—	—	—	307,266	122,706
SALINE COUNTY MINES	Reynolds Mining Co.	—	—	180,181	151,874	162,943	121,704
GALENA	American Smelting & Refining Co.	—	—	56,489 ²	87,925	123,129	119,822
PAGE	American Smelting & Refining Co.	153,718	132,656	76,831 ²	109,584	128,751	117,411
BIRKETT	Eagle-Picher Co.	—	—	—	121,000	135,842	112,261
EDWARDS	St. Joseph Lead Co., Edwards Div.	—	—	—	121,768	121,648	104,694
BIG BUCK	Standard Uranium Corp.	—	—	96,538	133,259	94,334	102,021
DAISY	Banner Mining Co.	—	—	60,097	76,003	90,117	101,033
SECTION 10	Kernac Nuclear Fuels Corp.	—	—	—	—	100,000	—
MI VIDA	Utex Exploration Co.	—	—	—	—	102,556 ⁴	91,964 ⁴
MINERVA NO. 1	Minerova Oil Co., Fluorocar Div.	67,841	48,272	70,651	66,771	88,296	86,021
MARQUEZ	Calumet & Hecla, Inc., Uranium Div.	—	—	—	—	—	81,225
CRYSTAL-VICTORY	Minerova Oil Co., Fluorocar Div.	—	—	9,746	93,320	85,548	72,315
BADON	Hecla Mining Co.	—	—	3,906	53,603	62,142	68,270
MINNESOTA-HI ORE	Kennecott Copper Corp. (Nevada Mines Div.)	—	—	—	390,175	721,237	67,930
NORTH ALICE	Homestake Mining Co. & LaSai Mining & Development Co.	—	—	—	—	23,073	66,184
IKE	Hidden Splendor Mining Co.	—	—	—	—	27,915	65,716
GOLD KING	Lovett Mining Co., Inc.	—	—	—	—	68,909	62,972
LUKE	Montana Phosphate Products Co.	—	—	—	—	10,000	62,000
LA SAL SHAFT	Homestake Mining Co. & LaSai Mining & Development Co.	—	—	—	—	87,767	61,068
SECTION 22	Kernac Nuclear Fuels, Inc.	—	—	—	—	55,000	—
FOLARIS	Hecla Mining Co.	—	—	—	50,806	50,304	48,393
COLUMBIA	Hidden Splendor Mining Co.	—	—	—	—	3,592	47,470
MAY FLOWER	New Park Mining Co.	—	—	—	—	60,167	43,803 ²
NEW IDRIA	New Idria Mining & Chemical Co.	35,486	43,282	36,235	22,517	37,102	42,124
DAYROCK, HERCULES,	Day Mines, Inc.	147,331	170,355	93,177 ⁴	116,039	92,972	38,261
TAMARACK		—	—	—	—	—	—
CORDERO	Cordero Mining Co.	—	—	—	—	35,156	35,714
GREEN RIVER	Four Corners Uranium Corp.	—	—	—	26,559	35,373	34,504
SILVER	Clayton Silver Mines	—	—	—	39,901	39,703	24,876
TROUT ALGONQUIN GROUP	Trout Mining Co.	—	—	—	—	44,215	24,724
SONGO	Woodward Iron Co.	—	—	—	—	166,215	24,585
200' PORTAL	Oscar-Mahoning Co.	—	—	—	—	15,090	23,924
FLUORINE	Bunker Hill Co.	—	—	—	—	450	23,438
CRESCENT	Banner Mining Co.	—	—	10,681	2,411	12,032	21,038
MINERAL HILL	Western Gold & Uranium, Inc.	—	—	97,464	107,334	51,868	20,937
SILVER REEF MINES	White Canyon Mining Co.	—	—	—	—	18,640	19,581
HIDEOUT	Minerova Oil Co., Fluorocar Div.	—	—	—	—	15,471	18,800
JEFFERSON	New Idria Mining & Chemical Co.	—	—	—	3,226	2,517	17,090
PACK RAT	Western Gold & Uranium Co.	—	—	—	—	6,449	14,235
ORPHAN	Four Corners Uranium Corp.	—	—	—	13,402	4,013	13,071
LARGO URANIUM	White Canyon Mining Co.	—	—	—	—	16,793	12,791
W. C. NO. 1	American Smelting & Refining Co.	96,010	49,468	41,799 ⁴	43,946	36,919	11,775
MORNING	American Smelting & Refining Co.	—	9,532	6,478 ²	7,253	9,689	9,616
JACK WAITE	Banner Mining Co.	—	—	83,084	84,771	82,084	7,425
MISERS CHEST	White Canyon Mining Co.	—	—	—	—	3,686	5,719
LESSIES	Four Corners Uranium Corp.	—	—	4,930	4,025	3,774	3,315
BULL CANYON	Minerova Oil Co., Fluorocar Div.	—	—	—	—	30,629	1,801
AUSTIN-BENZON	Four Corners Uranium Corp.	—	—	—	—	806	1,002
LION CREEK	Shattuck Denn Mining Co.	—	—	222,892	254,632	298,104	N.A.
IRON KING		—	—	—	—	—	—

1. Net tons. 2. Mine owned by Bunker Hill Co. 3. Production cut by 5 mos. strike. 4. Wet. 5. Mine placed on lease Oct. 1957. N.A. Not available.

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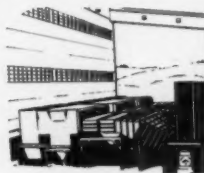


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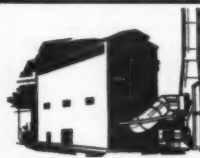


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Mechanical

DUST COLLECTORS

The Multiclone pioneered the modern principle of multiple, small-tube, high-efficiency centrifugal collectors—and is still unequalled in the field. Not only does it offer the higher separating efficiencies obtained by the greater centrifugal forces developed in multiple *small-diameter* tubes, but the Multiclone also is easier to service and maintain, is simpler to install because it requires no costly, complicated ducting, is far more compact, and offers many other important advantages that save money and boost efficiency on mechanical dust collection applications. For further data write for "Multiclone" literature!



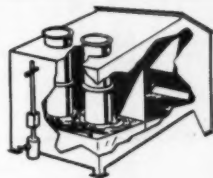
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HI-TEMPERATURE**

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Scrubbers

Where wet scrubbing methods of dust collection are applicable, Western Precipitation's Turbulaire-Doyle Scrubbers are ideal. They incorporate a unique *jet-action* principle that causes high velocity impingement of the incoming gases against the scrubbing liquid, thus forcing the dust particles deep into the liquid for more complete wetting and cleansing. This feature assures phenomenally high collection efficiencies with only moderate draft losses. Compactness, low maintenance, ready adaptability to corrosion-resisting construction and simple installation are other Turbulaire-Doyle advantages. For further data write for "Turbulaire-Doyle" literature.

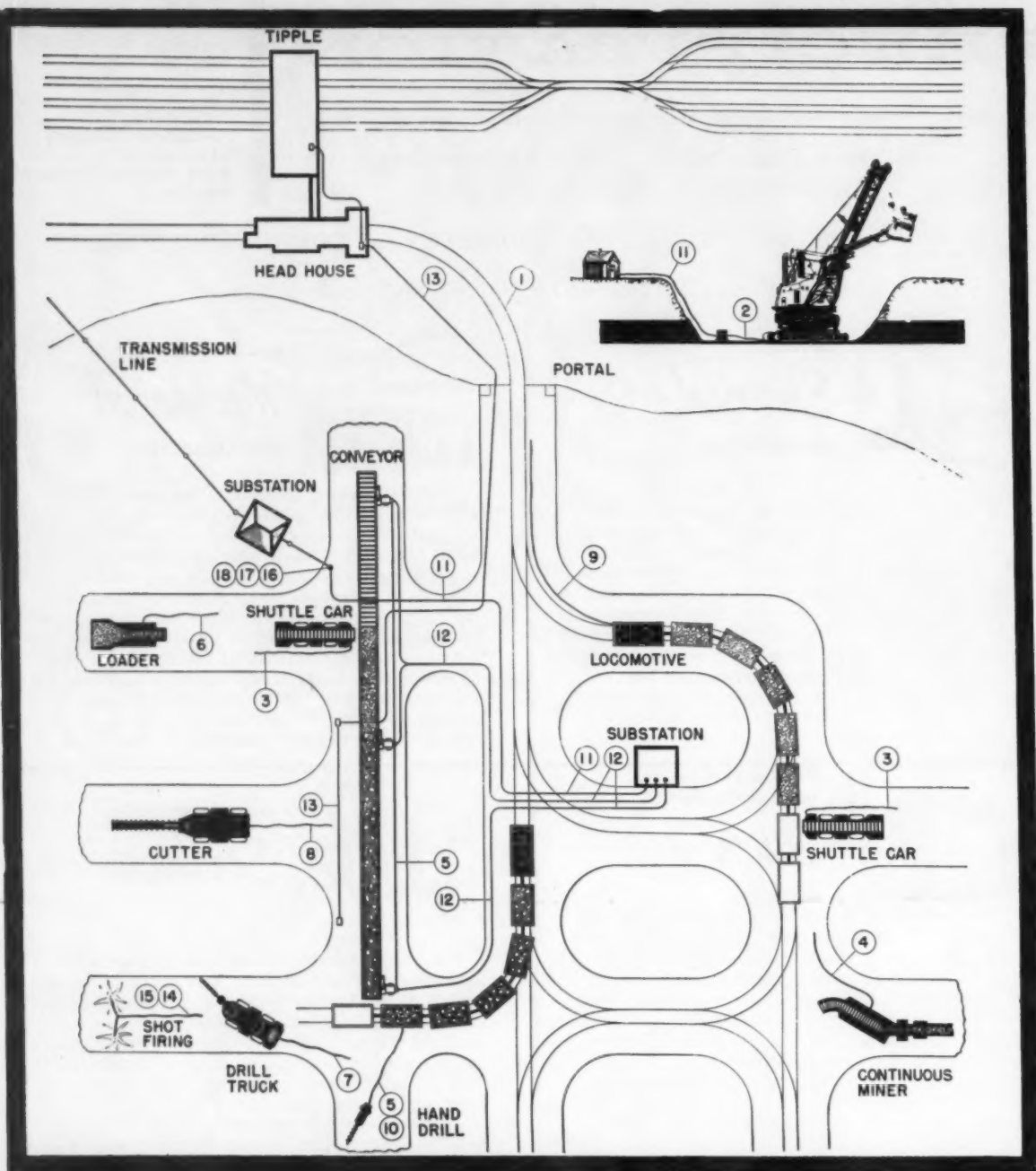
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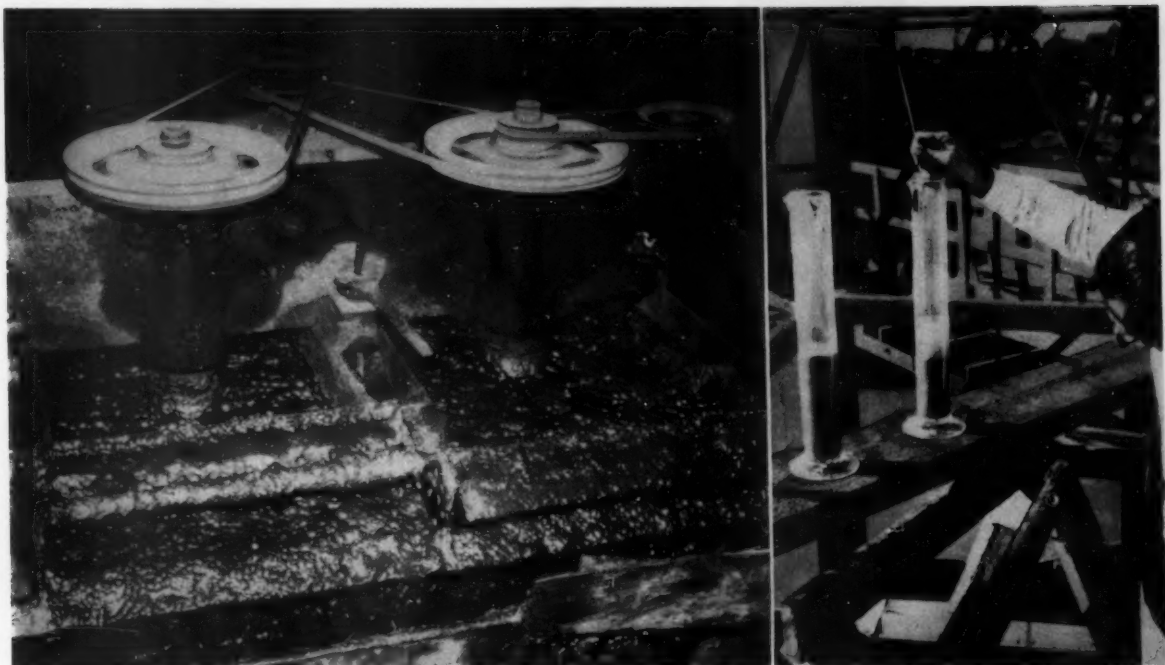
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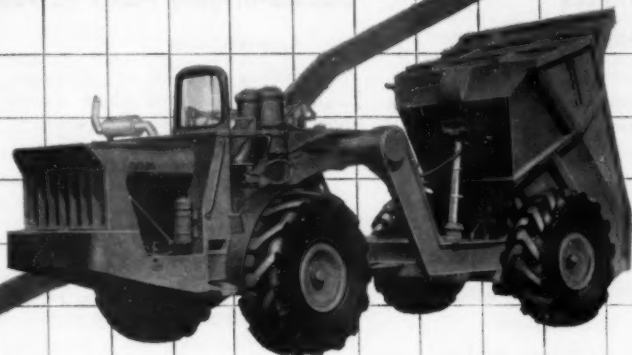
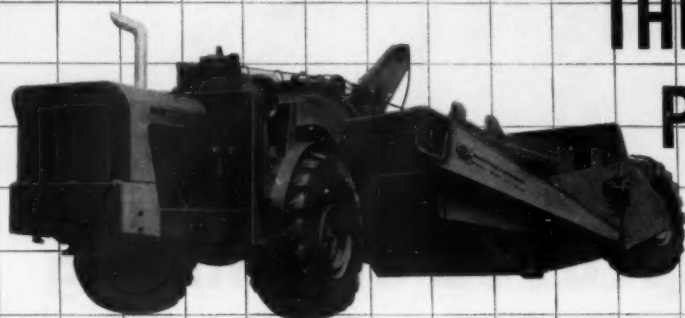
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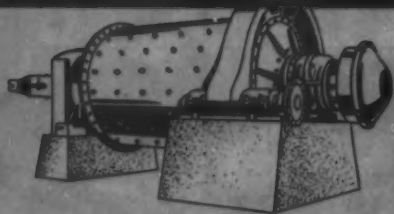
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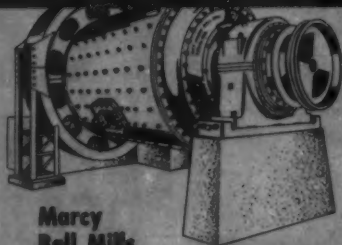
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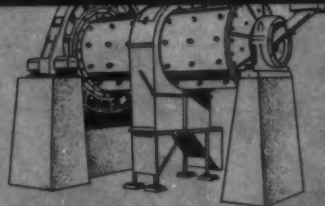
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Grinding materials 1½" or finer to a product as fine as 325 mesh; materials such as metallic ores, industrial minerals, specification sands, cement, brick, lime, coke, clay, chemicals, fibrous materials.
Wet or dry grinding. Open or closed circuit.

Types

Grate discharge & overflow type ball mills.
Open end rod mills.
Center and end peripheral discharge rod mills.
Tube mills — Pebble mills
Acid-proof mills — Batch mills

Sizes

29 different diameter sizes, from 12" to 12'6" inside diameter.

Capacities

Up to 6650 tons per 24 hours per mill

Skinner Furnaces

Applications

Roasting molybdenum sulphide concentrates; roasting uranium-vanadium ores; drying uranium oxide precipitate; decomposition of oil sludge; lime burning; drying copper concentrates; roasting zinc ores; manganese reduction; dehydration of alunite; calcining of basic alum, lime sludges, clays, foundry sands, carbon, etc.; incineration of sewage.

Types

The Skinner is a cylindrical, multiple hearth type furnace, providing maximum flexibility, minimum dust losses, and the advantage of being able to handle sticky materials.
Gas, oil or coal fired.

Sizes

2 to 12 hearths
4'0" to 23'6" inside diameter
22 to 4000 sq. ft. hearth area

Massco-Grigsby Pinch Valves

Applications

For handling corrosive and abrasive pulps and liquids; and where remote control and/or automatic regulations are desired.

Types

Available with rubber, neoprene, or specially compounded rubber sleeves. Manual and power driven closing mechanisms.
Can be equipped for remote control and automatic regulation.

Sizes

1" to 14" inside diameter.

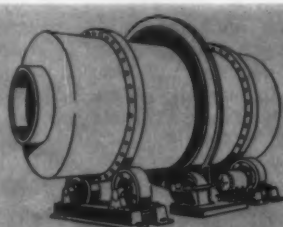
Capacities

Pressures to 150 psi.
Temperatures to 200° F.

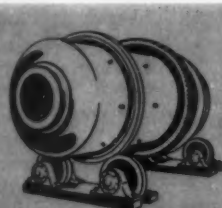
Specialized engineering and laboratory testing services available for ore-milling problems.



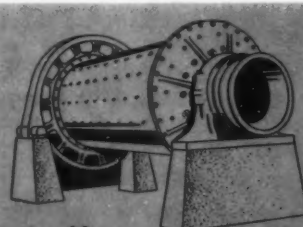
Burt Filters



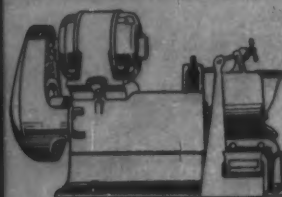
Fusion Furnaces



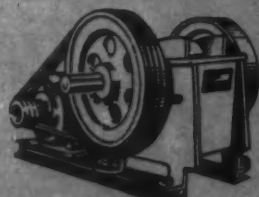
Leaching Drums



Scrubbers



Massco-McCool Pulverizer



Massco Lab Jaw Crusher

Licensed Manufacturers and Sales Agents in Canada, Australia, Sweden, England and South Africa.

Sales Agents in Chile, Peru, Philippine Islands, Japan, New York City (for Continental Europe), and in the principal cities of the United States.

Akins Classifiers**Akins HMS Separators****Akins Densifiers****Akins Classifiers****Applications**

Classification of solids by size and/or gravity.

Dewatering.

Washing ore, coal, oyster shell, sand and gravel.

Desliming and deoiling phosphate rock and concentrate.

Types

Standard, simplex and duplex, for size separation, or dewatering, of coarse material.

Submerged spiral, simplex or duplex, with large pool, for separation of finer sizes.

Flared tank units provide maximum setting area and reduced overflow velocity.

Special units for handling acid or caustic solutions and salt brines.

Lifter bars and spray water box arrangements are available for difficult washing problems.

Sizes

12" to 84" spiral diameter, simplex and duplex.

Capacities

Sand raking capacity: up to 7860 tons per 24 hours (Duplex machine)

Overflow capacity: up to 2386 tons per 24 hours (Duplex machine)

For Complete Information

...on these and other Proved and Improved Mine and Smelter products, write for catalogs.

Akins Heavy Media Separators**Applications**

Any material that is amenable to heavy media separation of its components, such as coal, iron, manganese, fluorspar, chrome, lead-copper, tungsten, garnet, topaz, gravel.

Types

The two basic types of Akins Separators are modifications of the standard and submerged spiral Akins Classifiers.

Sizes

Spiral-diameter sizes from 12" to 84".

Capacities

Sink: up to 230 tons per hour.

Float and middling: up to 290 tons per hour.

Akins Heavy Media Densifiers**Applications**

Used for recovering and cleaning medium solids.

Types

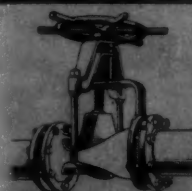
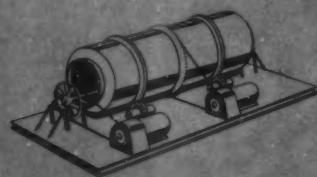
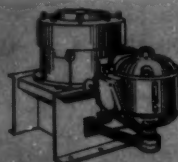
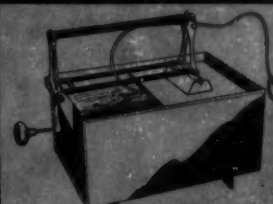
The Akins Densifier is a modification of the submerged spiral Akins Classifier.

Sizes

Spiral-diameter sizes from 16" to 66".

Capacities

Raking capacities up to 49.5 tons per hour.

Esperanza Drag Classifiers**Skinner Roasters and Dryers****Wilfloy Tables****Massco-Grigsby Rubber Pinch Valves****Marcy Pulp Density Scale****Pug Mills****Vezin Sampler****Massco Gy-Roll Reduction Crusher****Lab Crushing Rolls****Massco-Adams Reagent Feeder**

Manufacturing Division

THE MINE AND SMELTER SUPPLY CO.

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3800 RACE STREET

NEW YORK 17
122 E. 42nd STREET

SALT LAKE CITY 1
121 W. 2nd S.

EL PASO
P. O. BOX 1162

DIAMOND BITS

and CORE BARRELS

SERIES D — Core Barrel

This barrel is manufactured in EX, AX, BX and NX sizes. It comes in 10 ft. and 5 ft. lengths, and takes a core ranging in size from .845" dia. (EX) to 2.060" (NX). With a full floating inner tube to prevent friction grinding and minimize core wash, this barrel will recover the greatest possible amount of core even in the softer, more fractured formations. It is excellent for use in underground or surface drilling.

SERIES C-2 — Core Barrel

Increased annulus between tubes and between outer tube and hole allows this barrel to be used with either water, mud or compressed air.

Manufactured with heavy wall tubing, this barrel is recommended for your heavy duty coring job. The series C-2 barrel is available in AX to NX sizes; 20, 10 and 5 ft. lengths.* Core sizes run from 1.067" dia. (AX) to 1.875" dia. (NX). NX size is illustrated.

*Recommend AX in 10 and 5 ft. lengths only.

3½" x 2½" Core Barrel

This barrel, similar to our Series 250P oil field barrels, is made for use with heavy duty drills. It can be used with water, mud or air and takes a 2½" core. It is available in 20, 15, 10 or 5 ft. lengths.



Trouble-free operation — minimum maintenance — maximum core recovery. This is what you buy in Christensen coring equipment. Equipment designed for every type operation and every size drill, from portable to heavy duty types.

Christensen manufactures many modifications and adaptations of the above equipment. For detailed information on our complete line of coring and drilling equipment, write for catalog SD507.



FOR MINING

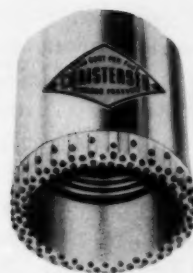
EXPLORATION



The NXD-2 pilot type bit has proved a most efficient style for core recovery in soft formations and is currently being adapted to many of our core barrels. Tungsten carbide grit hard facing is available.



The non-coring concave diamond bit cuts a straighter hole, lasts longer than conventional bits and economically cuts the hardest rock. It is ideal for drilling pilot holes, blast holes, grout holes, drain holes and cement in diamond drill holes.



This casing shoe has box thread, extra hard matrix and 25 per carat size diamonds. Casing shoes are set without inside gage stones to allow a corresponding size bit and reaming shell to pass.



This is a standard bevel wall, rib type, impregnated core bit with light diamond concentration. It is designed to overcome the problems of hard, fractured, abrasive and, in general, difficult to core rock. There is no salvage or credit value for returned bits of this type.



This balanced type reaming shell, designed and perfected by Christensen, utilizes an extra hard matrix metal that increases shell life over that of the insert type shells. There is an additional charge for hard facing.



This casing bit has box thread and extra hard matrix. It is used for collaring holes and for reaming a hole for casing. It can be supplied with a pin thread.

Rock differs in drillability from area to area. Christensen will custom design your bits to insure you of drilling at "Less Cost Per Foot." May we serve you?

Diamonds Mean, "Less cost per foot."

CHRISTENSEN DIAMOND PRODUCTS

1937 SOUTH SECOND WEST • SALT LAKE CITY, UTAH



"READY-TO-USE" DYNATEX* COSTS LESS THAN PRILLS

Extensive tests conducted in open-pit mines and quarries have shown that Dynatex produces rock or ore at a lower cost than prilled ammonium nitrate-fuel oil mixtures.

These tests, conducted under actual working conditions, proved that Dynatex permitted an increase in the distance between drill holes as well as an increased burden. Economies were effected all along the line. The explosives loading factor was reduced, as were loading time, labor, drilling, and blasting costs.

If you have, or are now using, a prilled ammonium nitrate-fuel oil mixture, be sure to test Dynatex on your next blast. Our technical representatives will be glad to show you how Dynatex blasting agent can cut your costs, too. Phone or write our nearest branch office for complete information.

NO FUSS—NO MUSS. No mixing on the job—Dynatex is delivered ready for use.

QUICK LOADING. In cartridges, Dynatex is quickly loaded into bore holes. Where conditions permit, Dynatex may be poured into bore holes.

UNIFORM STRENGTH AND QUALITY. Dynatex is a blasting agent of uniform known strength and dependability.

CHOICE OF PACKING. Dynatex is available in multiwall paper, special burlap or Flexo-Bag® containers, or in fiber drums of standard diameters.

*Hercules trademark



KR59-1

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Calif.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Calif.

Explosives Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington, Delaware



HERCULES

Advanced Engineering and
Quality Craftsmanship since **1884**

MODERN QUALITY EQUIPMENT AND MACHINES

Eimco Rocker Shovels and Air Locomotives — Air or electric powered. Model shown is Eimco 21 Loader, standard for dependability and high speed, low cost, rock loading wherever there is underground mining. Also in model numbers 12B and 40H. Eimco Air Locomotive with exclusive two-speed transmission for mine or contract jobs.

Eimco 630 Tractors — Air or Electric powered trackless underground operation. Pictured is Eimco 630 Excavator also available with integral hopper at rear. Other models include the basic tractor; tractor-dozers; and tractor-drill, which can be fitted with a variety of drilling attachments.

Eimco 635 Crawler Loader — High capacity with conveyor discharge. Will work in headroom as low as 8' 8".

Eimco 105 Tractors and Tractor Units — The modern line of tractors. Up-front operator position, Diesel powered through torque converter — exclusive Unidrive and Dual Final Drives. Tough, rugged, maneuverable, available as 105 Tractor-Dozer; excavator; model 125-Front End Loader and Fork Lift and 155 Conveyor-Loader.

Eimco Filters — Special equipment for dewatering metallurgical slurries. Continuous vacuum drum type and disc type filters. Also plate and frame type, horizontal rotating units and "Roto-Belt" filters. Eimco's Research and Development Division can help you solve any filtration problem!

Eimco Thickeners — Thickeners of Eimco's Process Engineers Division design are heavy duty construction for metallurgical and chemical processing plants. Eimco, the leader in the design, engineering and manufacture of machinery and accessories for liquid-solids separation can assist you in solving your processing problems.

Other Eimco Products — Eimco Folding Scraper, specially designed for use in mining.

Eimco Pneumatic Winch for lifting or tugging. High starting torque, wide range speed control, dependable in operation.

Eimco Geared Air Motors, reliable, economical, rugged.

Eimco Ball, Rod or Tube Mills, preferred equipment in ore dressing plants throughout the world.

Eimco Wirebraid Air Hose, first wire braid air hose available, with exclusive features.

For details or specifications on any of the above or other Eimco quality products, please contact the sales office nearest you or write to The Eimco Corporation, P.O. Box 300, Salt Lake City 10, Utah.

THE **EIMCO**[®]
CORPORATION
SALT LAKE CITY, UTAH
EXPORT OFFICE: 51-52 SOUTH STREET
NEW YORK 5, NEW YORK



FOR CONTINUOUS SERVICE IN HEAVY DIGGING **MARION 181-M**

The new levels of output and efficiency made possible on operations that can use large haulage units make the Marion 181-M a logical machine for expanded pit mining operations.

Here's a husky 8-yard machine with the traditional strength, power and endurance of Marion mining shovels - - plus small machine cycle time for an extra payoff every day.

With low-maintenance Ward-Leonard controls, power is applied smoothly and quickly,

yet held within controlled limits that safeguard the machine against undue shocks or strains.

The chain propel simplifies crawler design and provides increased protection for the final propel mechanism, especially on shovels where the drive chain is enclosed and dips in oil.

A disc-type air clutch permits the operator to engage the travel mechanism without stopping the machinery, permitting faster move-ups.

If you haven't seen Bulletin 439 on this 8-yard Marion, write for your copy today.

CONSULT



MINING SPECIALISTS

for lowest costs on your property!

MARION POWER SHOVEL COMPANY • Marion, Ohio, U.S.A.

A Division of Universal Marion Corporation

Dependable testing equipment

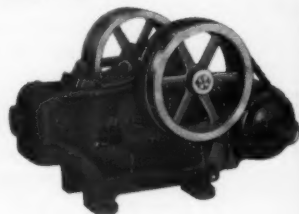
Time proven equipment is your assurance of efficient, trouble free testing year after year after year. Whatever follows... melting, refining, processing or production... it begins with accurate, uniform *testing*. Denver Fire Clay products and equipment have been serving the testing field for 83 years, efficiently and economically.

Write for full information about any of the products on this page. Other DFC quality products include fire brick and special shapes, refractory specialties, industrial furnaces, burners, incinerators.

D.F.C. LABORATORY CRUSHERS

Fast-Rugged-Economical

For reducing ore, rock or brittle substances from 2½ inches in diameter to ¼ inch in diameter or smaller at a rate of 50 pounds to 150 pounds per hour.



PCE FURNACES

For determining the Pyrometer Cone Equivalent of clays and refractories. Other types of clay testing furnaces are available. Write for information.

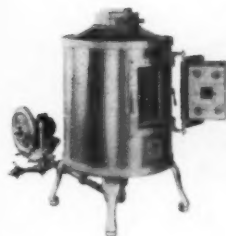


KERAMIC HIGH TEMPERATURE TEST KILN

Designed for experimental and development work in ceramic plants, research laboratories, schools, colleges and small potteries.

Top Temperature Cone 12 or 2435°F.

Muffle 14" inside diameter 17" high.



for 83 years...

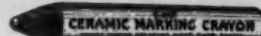
DFC METALLURGICAL CLAY GOODS



DFC Clay Goods... crucibles, annealing cups, muffles, trays, roasting dishes, scorifiers and ignition dishes... are known world wide for quality and dependability.

CERAMIC MARKING CRAYON

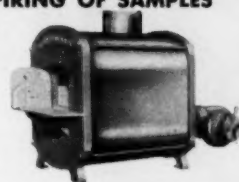
Ceramic marking crayons are manufactured in two grades for marks resisting temperatures to 2500° and 3000°F.



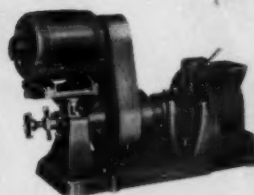
DFC No. 1F13 Hi Temperature Furnace FOR RAPID TEST FIRING OF SAMPLES

Top Temperature 2900°

Working Space
160 cubic inches



D.F.C. PULVERIZERS



Disc Type-Direct Drive

DFC Pulverizers are the perfect companion piece for the DFC Crusher.

Medium quartz ore can be reduced from ¼ mesh size to 100 mesh at the rate of 1.4 pounds per minute.

(Any degree of fineness up to 120 mesh is obtained by turning a hand size wheel at the rear of the machine, and a lock nut holds any adjustment.)

SAMPLERS

Samplers are available in a variety of sizes, ranging from hopper top dimensions of 5" x 4½" to 18" x 10½".

Jones Pattern Samplers also available.



Please send me literature concerning

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DFB-4

DFC
THE DENVER FIRE CLAY COMPANY
3033 Blake Street
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USERS OF NEW ROEBLING HERRINGBONE* WIRE ROPE HOLD THESE TRUTHS TO BE SELF-EVIDENT...



That Herringbone is the most practical and needed wire rope development to come along in years.

Herringbone, the regular lay and Lang lay rope, is actually two-ropes-in-one rope. Thus, the qualities that make these two ropes good ropes, combine to make Herringbone excellent.

HERE'S WHY:

The steel core of Herringbone provides the ideal support for the two pairs of Lang lay and one pair of regular lay strands used in its construction. In addition, the outer wires are heavier for extra abrasion resistance, and good flexibility is maintained by the finer wires inside. This combination of features enables Herringbone to give longer service in most applications.

Herringbone has been used on a wide variety of excavating equipment and tough hoisting jobs with impressive results. Its applications are practically unlimited on installations which call for all-steel ropes and on many where fiber core ropes are now being used. Another of Herringbone's added attractions is the fact that it eliminates the necessity for stocking Lang lay rope for one job and regular lay for another.

Your Roebling Distributor has Herringbone right now. He has, also, copies of a brochure describing Herringbone, the newest Roebling Star Performer. If you wish, write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for literature and anything you'd like to know about Herringbone.

*Reg. App. For

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation



Engineered pumping of abrasives corrosives acids

RUBBER-LINED PUMPS

HYDROSEAL VERTICAL sump pump



Brochure
No. 757

RUBBER-LINED or ALL-METAL.
Four sizes: 1½" to 6"
Slurry, Sand & Dredge

To have an easy key to the correct type and size of pump, write us for "Technical Data" Brochure No. 357. For information in the category of your need, use the specified number. In the refinements of application, our engineers can help you.

METAL PUMPS

PACKLESS Pumps

No stuffing box
No packing
No mechanical seal
No liquid seal
No exposed metal parts



Capacity range:
25 to 800 GPM

Brochure
No. 857

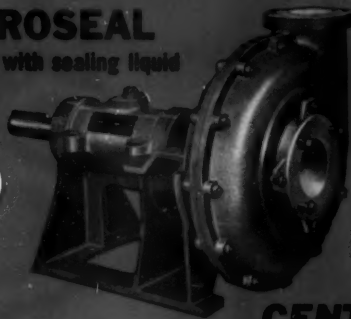
Technical Data

HYDROSEAL
CENTRISEAL
PACKLESS
CENTRIFUGAL PUMPS

Brochure
No. 357

INTERCHANGEABLE

HYDROSEAL operates with sealing liquid



Brochure
No. 457

**Split-Shell
SLURRY and
SAND Type**

2" to 14"

Brochure
No. 557

CENTRISEAL
delivers the pulp undiluted

Flex-Check Valves RUBBER-LINED



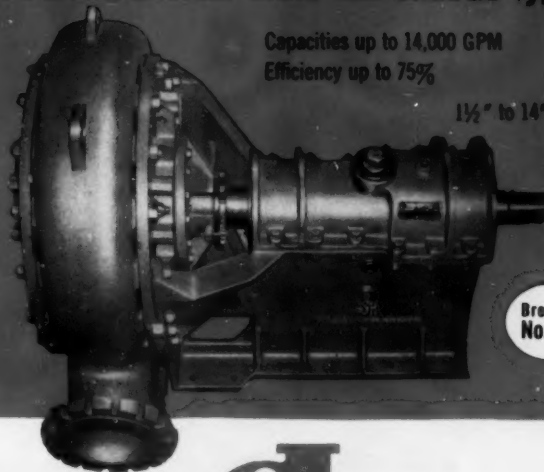
For pipe diameters up to 12"
For solids up to ¼"

Brochure
No. 957

HYDROSEAL SAND and DREDGE Type

Capacities up to 14,000 GPM
Efficiency up to 75%

1½" to 14"



Brochure
No. 657

THE ALLEN-SHERMAN-HOFF PUMP CO.
Dept. J—259 E. Lancaster Ave., Wynnewood, Pa.

Representatives throughout the World



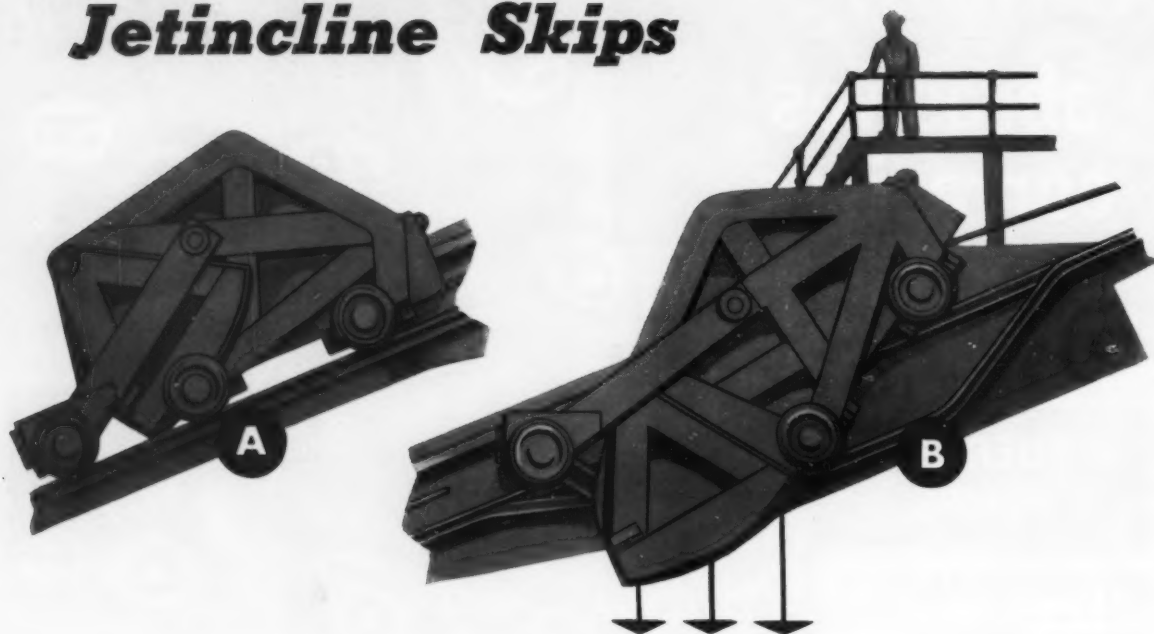
HYDROSEAL and CENTRISEAL

SAND, SLURRY & DREDGE PUMPS

MAXIMIX RUBBER PROTECTED

For economical open pit haulage . . .

LAKE SHORE Jetincline Skips



The JETINCLINE Bottom Dump Skip has all the advantages of Lake Shore's famous "Jeto" skip—fast, clean dumping and lasting construction. Capacities are available up to forty-five tons.

Dumps clean every trip. As the skip approaches the dumping station, the narrower rear body rollers follow the lower rails of the scroll and the skip is actuated. As this occurs, the rear door opens and the ore flows out unrestricted. The stubborn, sticky ore in bottom corners is immediately cleaned by the following loose ore.

Dumps fast every trip. Because the skip body rotates a limited amount during dumping, it therefore transfers minimum stresses to the headframe and can be dumped faster and more smoothly than any other type of skip.

Rugged construction. High manganese wheels of the JETINCLINE skip are equipped with tapered roller bearings and the axles are spring mounted on three point suspension directly to the body of the skip. This arrangement allows the highest concentration of weight and strength to be placed where it is needed most, in the body. In the largest skips the body is reinforced with sections that run to sixteen inches in thickness. In addition, all skips are equipped with heavy cushioned liners inside.

For increased production, many mines have converted to Lake Shore "Jeto" and JETINCLINE bottom dump skips. Their faster dumping and lasting construction are your assurance of more production at lower cost. For full details see your Lake Shore representative or write our Engineering Division, Iron Mountain, Michigan.

LAKE SHORE, Inc.

Lake Shore Engineering Division

IRON MOUNTAIN 1, MICHIGAN

40 TO 400 MESH OUTPUT UPPED AS MUCH AS 300%

FEED SPOUT



ENGINEERING AIR SEPARATORS TO SPECIFICATION

... comes naturally to Sturtevant engineers. They have a tradition of success in developing dry-processing equipment and plants for more than 75 years — from the first rock emery mills to the most modern fluid jet micron-grinding equipment. If your problems include any of the processes listed in the coupon, it will pay you to investigate.

WHAT CAN A STURTEVANT AIR SEPARATOR DO IN YOUR PULVERIZING SYSTEM?

In the cement industry, Sturtevant Air Separators have a tested record of increasing mill capacities from 25 to 300% while lowering power consumption as much as 50% — when used in closed circuit with grinding mills. Maybe they can do as well for you.

Easily adaptable to your materials. Sizes of Sturtevant Air Separators range from 3 to 18 feet in diameter. They deliver fines from 40 to 400

mesh at rates as high as 100 tons per hour.

Designed to cut costs! Sturtevant Air Separators are built for a lifetime of low-downtime service. Rugged construction plus easy accessibility for quick maintenance (typified by the "OPEN-DOOR" design in other Sturtevant equipment) assures more output per machine-year. Check the coupon for more information.

STURTEVANT

Dry Processing Equipment

The "OPEN-DOOR" to lower operating costs over more years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

My dry-process materials are:

Desired capacity is:

Name _____

Firm _____

Street _____

City _____

Title _____

State _____

Zone _____

STURTEVANT MILL COMPANY, 157 Clayton Street, Boston 22, Mass.

Please send me your bulletin on Air Separators ☐

Also bulletins on machines for:

☐ CRUSHING

☐ GRINDING

☐ PULVERIZING

☐ MICRON-GRINDING

☐ SEPARATING

☐ BLENDING

☐ SUPERFINE SELECTING

☐ GRANULATING

☐ CONVEYING



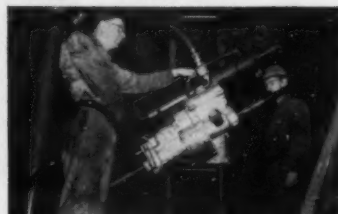
SLUSHER IN MICHIGAN IRON MINE



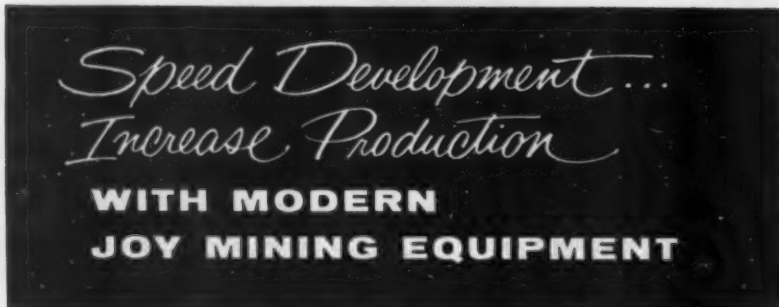
SINGLE DRUM AIR HOIST IN MONTANA COPPER MINE



LOADER AND SHUTTLE CAR IN FRENCH IRON MINE



CORE DRILL IN PENNSYLVANIA IRON MINE



AXIVANE FAN IN COLORADO METAL MINE



AIR LEG DRILLS IN CANADIAN URANIUM MINE



DRILLMOBILE IN MISSOURI LEAD MINE



EQUIPMENT FOR MINING...FOR ALL INDUSTRY



Core Drills



Slushers



Rock Bits



Drillmobiles

W&W M-7843-308

JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company
(Canada) Limited, Galt, Ontario



At Japanese asbestos mine

Tournapull Rear-Dump hauls 28,900 cu yds per month in spite of snow, rain



ON mountainous Hokkaido, northernmost of Japan's four main islands, Nozawa Asbestos Cement Company operates the open pit Yamabe Mine. An average of 15,000 tons of asbestos ore and limestone is removed and processed monthly for industrial use. Three power shovels excavate overburden and asbestos rock. Eight haul units carry the material a distance of 1640 feet for disposal or processing.

In this cold, moist northern climate, with its deep snows in winter and frequent rain in other seasons, pit operation is limited to an average of 20 days per month. Haul roads which lead from pit to crusher are well maintained but unpaved. Grades of up to 15% are encountered; in bad weather, the routes are slippery.

Hauls 17 cu yds per trip

One of the Yamabe pit haulers is a LeTourneau-Westinghouse C Tournapull with a 22 ton Rear-Dump. It moves 1 cu yds of rock and clay per trip. The C Rear-Dump hauls an average of 28,905 cu yds of material per month. This is 6,539 cu yds more than a dump truck in the fleet which is rated at the same tonnage capacity.

Averaged 15.6 mph in snowstorm

Nozawa's Rear-Dump was driven to the pit from Muroran, Hokkaido, a distance of 250 miles. The journey was made in a heavy snowfall, yet the rubber tired hauler averaged 15.6 mph. In its first year of operation, the

At the Yamabe Mine, Hokkaido, Japan, Tournapull operator dumps a C Rear-Dump load fast by simply pressing down electric-control switch. Main weight of machine is concentrated on front drive wheels for maximum traction.

Rear-Dump worked a total of 2,600 hours without need of repairs or overhaul.

Proven reliable in all climates

Reliability of Tournapull Rear-Dumps in all weather conditions is a big reason why they are used in pits, quarries and mines throughout the world. Ask for specifications. Expert service on these machines is always available from your area distributor.



LETourneau-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

DENVER

Complete Mill Equipment

DENVER AGITATORS AND CONDITIONERS

3' x 3' to 50' x 50'



Heavy-duty as well as acid-proof construction is available. V-belt or enclosed gear-head drive available, also turbine propeller agitators for large tank, slow speed operation. Write for Bulletin A2-B4.

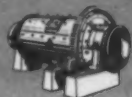
DENVER MILL DESIGN AND ORE TEST SERVICE



A complete, reliable service consisting of: (1) testing your ore, (2) providing flow sheets, (3) designing mill layout, (4) providing complete mill equipment. Assures you the best, most practical and economical way to process your ore. Saves time and money, eliminates risk. Write for Bulletin T4-B21.

DENVER Steel Head BALL AND ROD MILLS

3' x 2' to 10' x 20'



Cast steel heads, welded steel plate shells. Self-aligning oil bath lubricated trunnion bearings. Greater capacity since both diameter and length are measured inside new liners. Five types of discharge trunnions. Laboratory, pilot-plant and ceramic lined spherical mills for acid grinding also available. Write for Bulletin B2-B20.

DENVER PULP DISTRIBUTORS

Capacity to 10,500 GPM



Simple, accurate, positive. Distributes pulp automatically to any number of parallel circuits. Self-rotating or motorized. Powered by force of material being distributed. No operator or adjustments are necessary. Write for Bulletin D2-B2.

DENVER Forced-Feed JAW CRUSHERS

2 1/4" x 3 1/2" x 36" x 48"



Cast steel frame, manganese jaw and cheek plates. Anti-friction pitman and side bearings. Highest capacity assured by extra long jaws with greater crushing area and forced feed operation. Uniform product size range controlled by easily adjustable jaw opening. Write for Bulletin C12-B12.

DENVER AUTOMATIC SAMPLERS

16" to 60" Cutter Travel



Extra rigid track and ball-bearing wheels assure positive travel and timing of sample cutter. Denver Vezin Type, Denver Snyder Type, or complete sampling systems available. Simple, accurate, low cost. Sampler mechanisms and cutters in stock. Write for Bulletin S1-B4.

DENVER Adjustable Stroke DIAPHRAGM PUMPS

1" to 10" Simplex and Duplex
Capacity to 1000 GPM



Ability to adjust stroke while pumping makes pump particularly valuable for metering volumes of liquid. Specially-designed nylon reinforced rubber diaphragm gives long life. Low head design. Anti-friction bearing construction. Optional ball or bayonet valves. Write for Bulletin B8-B12.

DENVER SRL SAND PUMPS

Up to 3000 GPM



Simple design, lighter weight and accurately engineered rubber parts increase efficiency 1 1/2 to 3 times over other sand pumps—lowers pumping costs as much as 40%. Molded rubber impellers and casing liners last up to 15 times longer. Available also as vertical sump pumps. Write for Bulletin P9-B10.

DENVER Agitator-Type DISC FILTERS

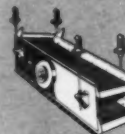
2' dia. x 1 Disc to 9' dia. x 12 Disc



Special, patented segment design uses both gravity and vacuum to give thicker, drier filter cake, eliminate blow-back. Available with exclusive, diaphragm-activated agitating mechanism in tank. Maintains uniform particle suspension, even distribution of cake. Write for Bulletin F9-B5.

DENVER DILLON SCREENS

1' x 3' to 6' x 14'



Gives fast, clean separation without blinding. Gives even, smooth flow of material because of patented "true-circle" eccentric action. Two bearing construction saves 50% horsepower over four bearing types. Suspended or floor-mounted units. Write for Bulletin S3-B15.

DENVER "Sub-A" FLOTATION

16 x 16 to 72 x 72



Simple, universal type tank can be converted from cell-to-cell flow to free-flow in the field. Three types of flotation mechanisms: (A) "Cell-to-Cell" (B) "Free-flow" and (C) Type "M" are interchangeable in universal tank. Denver "Sub-A" Flotation provides FLEXIBILITY of operation that gives you greatest net return.

DENVER Spiral Rake THICKENERS

3' x 3' to 150' x 20'



Enclosed, running-in-oil mechanism, gear sizes to 72" diameter. High strength worm gear rides on oil bath lubricated, replaceable formica pads for maximum stability. Visual overload indicator. Spiral rakes move settled solids to center discharge with continuous motion. Wood, steel or rubber covered tanks available. Write for Bulletin T5-B7.

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Denver Equipment
Items

Agitators for
Scrubbing
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Solvent Extraction

Industrial Waste
Reclamation
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Dryers

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Feeders
Tables
Tanks



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DENVER 17, COLORADO

PHONE: CHERRY 4-4466

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TOURNAPULL REAR-DUMPS: Available in 3 heavy-duty sizes for dependable off-road hauling. B Rear-Dump carries 35 tons (31.7 met. tons), choice of 335 hp Cummins or GM engines, with either sliding-gear transmission or torque converter. Top forward speeds to 34 mph (54.7 kph). C Rear-Dump has 22 ton (20 met. ton) capacity; 226 hp diesel engine with sliding-gear or constant-mesh transmission. Travel speeds are as high as 32.1 mph (51.6 kph). D Rear-Dump carries 11 tons (10 met. tons). Its engine is rated at 138 hp. Manual transmission is standard. Machine travels at forward speeds to 29.5 mph (47.4 kph).

TOURNAPULL SCRAPERS: Scrapers for Tournapull prime-movers are available in 3 sizes: B Fullpak, 28 yd³ (21.4 m³) capacity; C Fullpak, 18 yd³ (13.7 m³); and D Tournapull, 9 yd³ (6.8 m³). These scrapers are interchangeable with Rear-Dump, Bottom-Dump, Flatbed, or lift-and-carry Crane.



These mining machines will help reduce your operating costs

For the exacting requirements of mining, you need strongly built, dependable machinery. And for minimum costs, you need fast-working machinery as well. Strength, dependability, speed and effective use of power are built into every unit of the LeTourneau-Westinghouse line: Tournapull scrapers, Rear-Dumps, Tournatractors, and Adams model graders.

Check the economical production ability you get with these modern machines. Study the specifications. Ask for complete facts on the type of units which can be used profitably in your operations.



C TOURNATRATOR: This 218 hp, rubber-tired tractor travels anywhere under its own power, at speeds to 17.2 mph (27.6 kph) forward, and to 7.2 mph (11.5 kph) in reverse. Attachments include: dozer blade, Angledozer, root rake, push-block, power-control-unit, winch, side boom, tree stinger, rail coupler and snow plow. Tournatractor tows sheep-foot rollers, scrapers, rooters and other equipment.

ADAMS MODEL MOTOR GRADERS: These are available in seven models, with hp from 60 to 190. Standard models of heavy-duty type have eight forward speeds to 26 mph (41.8 kph), four reverse speeds to 13 mph (20.9 kph). A gear assembly for three extra low speeds is optional. The POWER-Flow 660 has 190 hp engine with torque converter. It has forward speeds to 27.4 mph (44 kph). The LeTourneau-Westinghouse POWER-Flow 550 has 135 hp with torque converter. The handy 60 hp "220" has forward speeds to 18.3, reverse to 3.2 mph. Attachments for grader line include: snow plow, wing, "Snow-Blo" attachment for wing, scarifier, power-shift moldboard, bulldozer, rotary snow plow, and Jebco Elegrader (for sidecasting materials).

POWER-Flow, Tournapull, Tournatractor, Angledozer, Fullpak—Trademark Reg. U.S. Pat. Off.; Adams—Trademark LA-1796-M-1m



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



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Goodall Rubber Company of Canada, Ltd., Toronto and Montreal

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"BROWN CORD"
AIR HOSE

Sizes $\frac{1}{2}$ " to 1", I.D.

A molded-and-braided hose for drilling, riveting, and other general pneumatic tool service. Tube, carcass and cover are combined to assure great strength and durability, without impairing flexibility and easy handling. Oilproof tube; rubber cover. Available in lengths up to 500 feet.



"SUBWAY"®
AIR HOSE

"Standard of Quality"

Sizes $\frac{1}{2}$ " to 1 $\frac{1}{4}$ ", I.D.

Another Goodall "Standard of Quality" hose especially built for rock drilling and all other heavy-duty air tool work. Light weight, flexible, easy to handle. Tough, oil-proof black "Synplastic" tube; highest quality wrapped duck carcass; wear- and weather-resistant red rubber cover, with yellow criss-cross stripe. Maximum lengths of 50 feet.



"HARDROK"®
WIRE BRAID
AIR HOSE

"Standard of Quality"

A super-hose for rock drills in construction, quarrying, mining and any other heavy-duty air service. Longwearing, oilproof "Synplastic" tube; horizontally braided steel wire carcass; tough yellow rubber cover, with black spiral stripe for identification. Light in weight, extremely flexible. Sizes $\frac{1}{2}$ " to 2", inclusive; two and three braid.



"NEWTYPE"
SUCTION AND
DISCHARGE HOSE

"Standard of Quality"

Patented wire-reinforced, woven cord construction gives "Newtype" unusual strength and durability for both suction and discharge. Light weight, extremely flexible. Cannot kink, buckle or collapse, yet if accidentally crushed, can be quickly rounded into shape again without harm. Smooth bore. Sizes 1" to 4", I.D. Max. lengths of 50 feet. Black cover, green spiral stripe.



"BUCKSKIN"
WATER HOSE

"Standard of Quality"

Sizes $\frac{1}{2}$ " to 4", I.D.

Long famous for quality and reliability in every water hose service. Tube is of slow-aging rubber stock—tough and pliable. Strong rubber cover withstands roughest surface wear and abuse, and affords maximum protection to cotton duck carcass from contact with moisture. Maximum lengths of 50 feet.



"INFERNO"®
STEAM HOSE

"Standard of Quality"

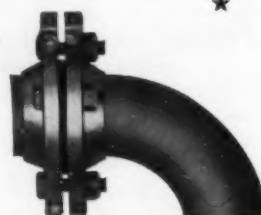
Sizes $\frac{1}{2}$ " to 2 $\frac{1}{2}$ ", I.D.

Built with multiple-layer wire braid carcass, heat-resistant tube and tough, abrasive-resistant red rubber cover with black spiral stripe for easy identification. Wire braids will cause steam to be diffused from damaged hose, providing a safety factor against sudden burst. Extremely flexible. Recommended for pressure up to 200 lbs., and temperatures up to 400°F. Maximum lengths of 50 feet.



"ALLSERV"
General Purpose
HOSE

For all types of pneumatic tools—also water, oil, chemicals, gasoline, paint spray, etc. A very flexible all-"Synplastic" molded-and-braided hose, in one, two or three braid construction, with tough wear-resistant red cover. Sizes $\frac{1}{4}$ " to 1 $\frac{1}{2}$ ", for working pressures from 200 lbs. to 300 lbs.



"KEMITE" DUCT
WITH
"FLANG-LOK"
Floating Flanges

For mine suction and discharge. Tube offers highest resistance to abrasive wear. Wire-reinforced carcass will not kink or collapse. Cover is tough, long-wearing rubber compound. Generally furnished with "Flang-Lok" Ends, to accommodate "Flang-Lok" Flanges. Sizes up to 4", I.D.

"FLANG-LOK" FLANGES provide the most convenient and efficient method of connecting "Kemite" Duct, effecting a leakproof, rubber-to-rubber seal, and permitting full flow. For bolt alignment, flanges turn independently of the duct or pipe. No gaskets or washers. All sizes.

"GOODITE" FLEXIBLE PIPE. Same construction and advantages as "Kemite" Duct, above, but available in larger sizes—up to 12", I.D.

"LONG-LIFE" PLASTIC PIPE

Goodall "Long-Life" Plastic Pipe is made in three types—Flexible, Semi-Rigid and Rigid—under conditions assuring the highest degree of quality and uniformity. The Flexible type is produced from virgin Polyethylene in Standard Wall, 75 lb. Job Rated and 100 lb. Job Rated, all certified non-toxic by N.S.F.

"Long-Life" Semi-Rigid Plastic Pipe is the Cellulose Acetate Butyrate type and is available in Standard Wall, sizes $\frac{1}{2}$ " to 6" inclusive.

The Rigid Type is a compound of unplasticized Polyvinyl Chloride (PVC)—well known for its superior impact and tensile strength and great resistance to a wide range of industrial chemicals. Made in Wall Thickness Schedules 40, 80 and 120, in sizes $\frac{1}{2}$ " to 8".

The GOODALL Trademark on hose, belting, boots and clothing for the Mining Industry represents a standard of quality and reliability established through eighty-nine years of manufacturing experience, backed by continuing research and development. Product specifications are based on first-hand knowledge of mine service requirements, with selected materials, expert craftsmanship and careful inspection assuring the utmost in on-the-job performance and economy.



CONVEYOR BELTING

"SUPER TRIPLE-S." Goodall's finest grade. Heavy duck carcass, high tensile rubber covers and strong friction between plies. Designed to carry run-o-mine coal, ores, slag and crushed limestone up to 10", wet or dry. Widths up to 48".

"TRIPLE-S." Same superior quality as "Super Triple-S," but of somewhat lighter construction. Widths up to 48".

"GOODALL." The right belt for the great number of lighter conveying jobs where the extra

qualities of "Super Triple-S" and "Triple-S" are not required. For sized coal, crushed stone, gravel, shells, ashes, etc. Widths up to 48".

ELEVATOR BELTING

"SUPER TRIPLE-S," "TRIPLE-S" and **"LA CROSSE"** are long-established Goodall brands, built to specifications that assure reliable, economical service under conditions for which each is designed. "La Crosse" made in widths up to 30", others to 48". Available with extra features—punching, stitching, end-less—if desired.

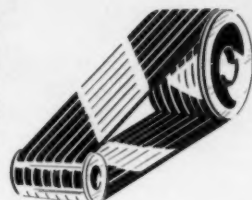


"POWER KING" TRANSMISSION BELTING

Friction surface, raw edge construction, especially built for most severe service. Minimum stretch and firm contact with pulleys at high speeds. Highest quality skim friction between plies. 35 oz. silver duck.

"POWER KING" High-Capacity V-BELTS

Built with larger, stronger, endless twin grommets to transmit greater H.P. This means fewer belts per drive, reduction in over-all weight, and less space required for any given load. The only high-capacity belts with so little stretch that the efficiency of the drive is not affected. Greater flexibility gives "Power-King" V-belts one-third more gripping power than other types... they pull heavier loads.



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PUMP DIAPHRAGMS
PUMP VALVES
PISTON PACKING
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LIQUID CORROSION-RESISTANT LININGS

GOODALL WATERPROOF FOOTWEAR and CLOTHING

Famous for Quality, Comfort and Long Wear

"TOE-SAVER"® BOOTS

Smooth, tough, flexible jet black rubber, heavy duck lined. Cushion insole. White cap over reinforced steel toe tested to withstand 2,000 lbs. pressure. Tire-tread soles. Hip, Style MB-346. Storm King, Style MB780. Short, Style MB946.

"WEAR KING"® BOOTS—Identical in quality with above, but without "Toe-Saver." Hip, Style MB345. Storm King, Style MB799. Short, Style MB945.

"RUBBERHIDE" SAFETY INNERSOLES. Sheet of high-tensile spring steel bonded between layer of top grade sole leather and layer of rubberized canvas duck. Puncture-proof.



MINER'S PACS Top quality black rubber Lace Pacs, Style ML-975, 16" high; Style ML-760, 15" high. Cushion insole. Cleated outsole. "Toe-Saver" Safety Toe. Also non-lace "Terra Haute" pacs, Style ML-271, in otherwise same construction. Other boots, workshoes, arctics and rubbers, built for extra wear and comfort.

COATS, JACKETS, OVERALLS

Items too numerous to describe here, in rubber, oiled and latex... all designed to afford maximum protection plus comfort in every kind of work. Style 338 coat is a long-time favorite... double back; corduroy-lined collar; length 49".

SAFETY HATS

"Hardboiled" Safety Hats in fibre glass and aluminum. Easiest to wear, yet providing maximum protection. Also, miners' caps, with or without lamp brackets.



TUNNEL SUITS

Style 80 jacket with Style 81 Overall makes the ideal suit for underground work. Other suit combinations to meet every preference or need.

★ ★ ★

Write for catalog describing the complete Goodall clothing and footwear line.



Nothing flits **STRIP MINING**

like this fast, mobile 6-yd. *diesel-powered*
MANITOWOC!

See how this heavy, far-reaching Manitowoc Model 4500 dragline works right at the edge of the cut. That's real stability, paying off in full buckets with every pass. With a 120 ft. boom matched to a big 6-yd. bucket, your operator can remove more overburden from one spot with less frequent machine moves. ■ Added to this tremendous reach and capacity you get power to spare... supplied by the most simple, efficient drive in the industry. Job proven diesel power lets you work anywhere, unhampered by a trailing cable and expensive electric power installations. Plus benefits include a realistic initial cost, simple maintenance, fast disassembly for rail or trailer shipment; convertibility to a 5½-yd. shovel and a high trade-in value. ■ A call to your Manitowoc distributor will bring all the important details... contact him now for information on earliest delivery.

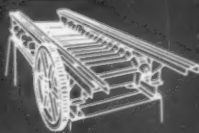
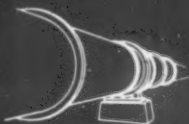
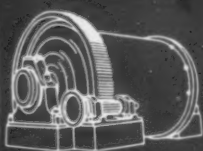
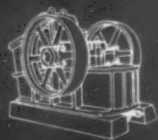


Manitowoc

MANITOWOC ENGINEERING CORP., Manitowoc, Wisconsin

(A subsidiary of The Manitowoc Company, Inc.)

CRANES 20 ton - 100 ton • SHOVELS 1-yd. - 5½-yd.



TRAYLOR . . . a name known to the mining industry throughout the world for producing machinery designed to deliver maximum production at the least possible operating cost year in and year out. For over half a century Traylor machines have been in daily use by hundreds of operators, demonstrating time and again Traylor engineers build the very best in mining machinery.

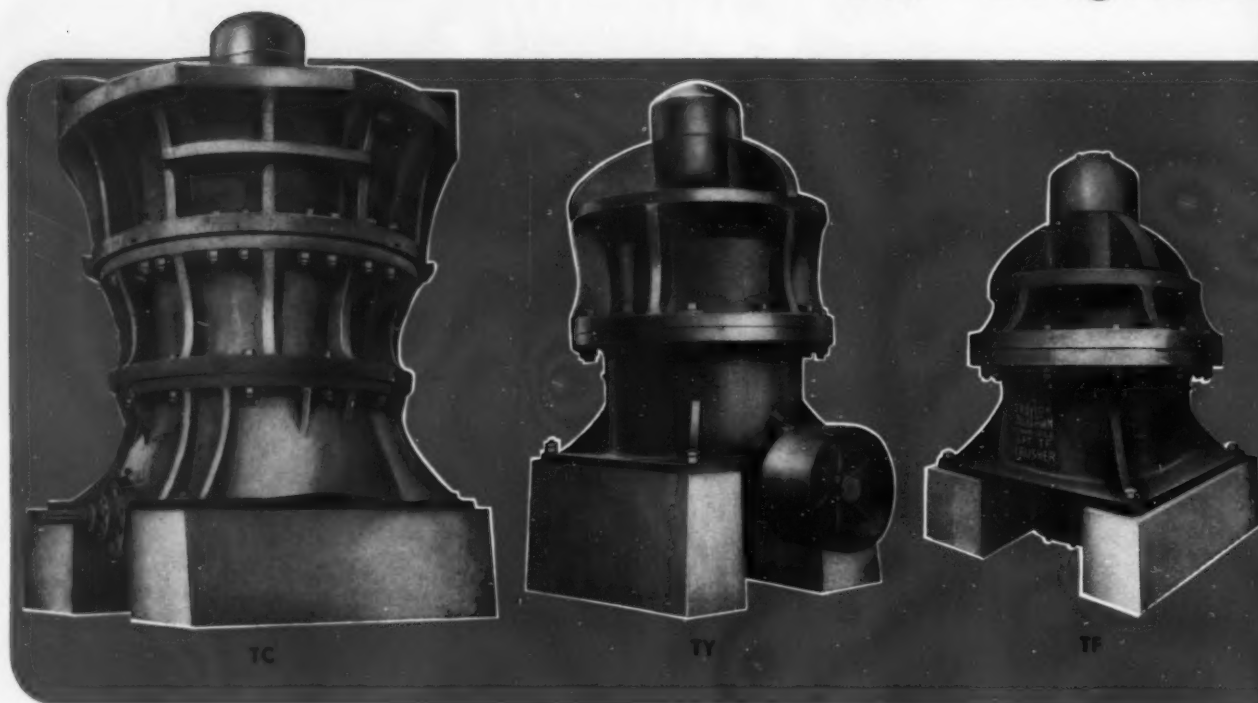


TRAYLOR ENGINEERING & MANUFACTURING COMPANY
ALLENTOWN, PENNA., U.S.A.



CRUSHING

offers the operating
TRAYLOR CURVED
An original



PRIMARY Crushers

Traylor Bulldog Gyratory Crusher Type TC is the most advanced design of large capacity gyratory crushers. Built in six sizes with capacities ranging from 245 tons of a 2' product to 4100 tons of an 11' product, these gyratories feature Traylor original non-choking, self-tightening bell head and curved concaves. Massive construction provides for shock absorption and at the same time all parts are readily accessible for maintenance. The Traylor patented dust seal provides a practical and efficient device for excluding dirt from the lubrication chamber. These are just a few of the features of the Traylor TC Gyratory Crusher—features you want in your crushing machinery.

SECONDARY Crushers

Traylor makes two types of reduction crushers: the TY in six sizes from 1'-3" to 5'-6" with feed openings from 3" to 22", and the TF Fine Reduction Crusher for operators whose needs demand economic production of 5/16" to 1-1/4" material in large capacity. Both of these crushers require less head room due to compact, simplified design. Traylor original curved concaves and self-tightening bell head are used in the TY and TF Crushers. The design, construction and operational features embodied in these reduction crushers are the direct result of Traylor's long and diversified experience and leadership in the ore and stone crushing field.



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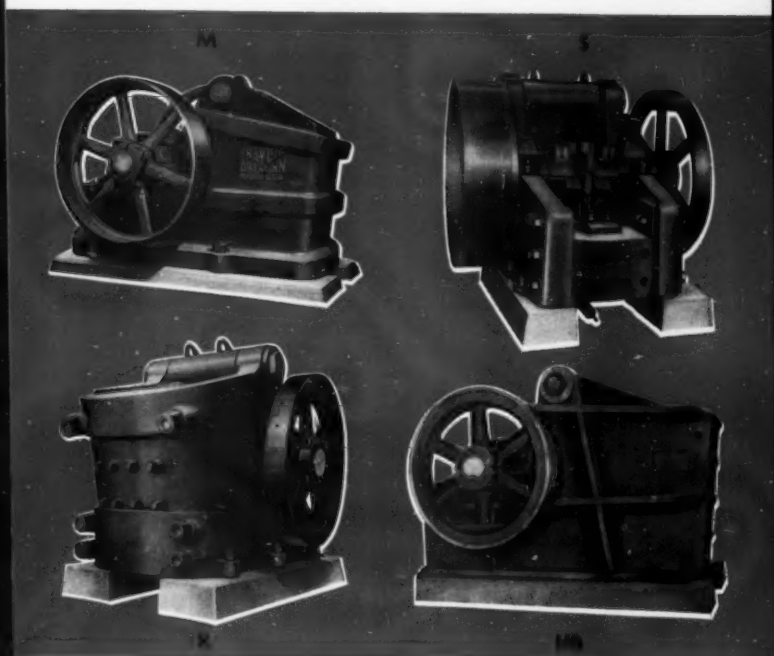
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MACHINERY

efficiency and economy of
CRUSHING SURFACES . . .
Traylor development



JAW Crushers

As a result of Traylor's many years of experience in building crushers, they have developed one of the most advanced groups of jaw crushers made. Traylor Jaw Crushers are built in five types with 18 different size feed openings. Capacities range from four tons of 7/8" material to 1,000 tons of 11" material per hour. The five types of Traylor Jaw Crushers are H, HB, M, R and S. All of these five machines are precision built to perform their rugged task efficiently.



Curved crushing surfaces, an original Traylor development, are shaped so that the faces are opposed to the direction of motion. Power requirements are reduced, even at finer settings, because more of the power applied is used as a direct crushing force.

By increasing the capacity of each succeeding feeding zone in the crushing chamber, choking and packing are practically eliminated.

Traylor's patented swing jaw suspension and originally developed curved jaw plates account for greater capacity at finer settings and longer life of jaw plates. Traylor's curved jaw plates will outwear ordinary plates as much as 3 to 1. All frames are reinforced at critical points to provide strength without excessive weight. For more information on Traylor-Made Jaw Crushers, state your requirements and a bulletin will be forwarded to you immediately.

AUSTRALIAN MANUFACTURER: Ingersoll Rand, Melbourne, V.I., Victoria, Australia

CANADIAN MANUFACTURER: Canadian Vickers, Ltd. P.O. Box 550, Place D'Armes Station, Montreal, P.Q. Canada.

La Paz, Montevideo, S. A.; Madrid, Spain; Oslo, Norway; San Juan, Puerto Rico; Manila, P. I.; London, England.

Other fine Traylor-Made Products in use by the mining industries throughout the world.



TRAYLOR CRUSHING ROLLS are built in three types—the Four Tension Rod type capable of delivering large capacities and standing up under the most severe, continuous service. Type AA and A Rolls are designed for lighter service. The range in size of the three rolls is from 18" dia. x 10" face to 78" dia. x 24" face with tension springs to develop pressures up to 30,000 lbs. per lineal inch of roll face. Write for bulletin #6637.

TRAYLOR CASTING MACHINES are built in two types: Circular and Straight Line. The Circular Casting Machine is heavily proportioned, driven by two motors through separate gear trains but with a single control and is designed to run in either direction. The track is conical, and the turn-table supporting the mold platform runs on flanged conical rollers. Traylor Casting Machines have been built in sizes up to 40'-0" and can be designed for anode, cathode, wire bar or pigs. Write for additional information.

TRAYLOR MANUFACTURES four types of feeders specially designed for application in the several steps of crushing, grinding, drying or calcining. These four types are the Sheridan Grizzly Feeder, the Apron or Pan Feeder, the Table Feeder and the Slurry Feeder. Grizzly Feeders are made in sizes from 3'-0" x 6'-0" to 10'-0" x 20'-0" and Apron Feeders in widths of 30" to 84" in any length required. All Traylor Feeders are adapted to the size and kind of material to be handled and are easily adjusted to vary their rate of delivery of material. For more on Traylor Feeders, write for bulletin #2114.

TRAYLOR ENGINEERS have pioneered and developed some of the outstanding features used in kiln manufacture. One of the improvements made by Traylor engineers is the design and perfection of the easy aligning, single roller supports used on Traylor Rotary Kilns, Coolers, Dryers and Slakers. The "full-floating" type of tire is another Traylor Kiln advancement. For details on Traylor Kilns, Coolers, Dryers and Slakers, write for bulletin #1115.



TRAYLOR ENGINEERING & MFG. CO., 1014 MILL ST., ALLENTOWN, PA.

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Pittsburgh 16, 1701 McFarland Road	LOcust 3-4434
York, 56 North Queen Street	YOrk 5415
RHODE ISLAND	
Providence 6, 240 Olney Street	JAckson 1-8820
TENNESSEE	
Chattanooga 2, Hamilton Natl. Bank Bldg.	AMHerst 6-5101
Knoxville 2, 531 S. Gay St.	2-2165
Memphis 3, 46 N. Third St.	JAckson 7-0377
TEXAS	
Arlene, 412 First National Bank Bldg.	ORchard 4-3472
Amarillo, 301 Polk St.	DRake 5-1566
Beaumont, 490 Orleans St.	TERminal 5-2355
Corpus Christi, 416 N. Chaparral St.	TULip 3-3-8521
El Paso, 215 N. Stanton St.	KEystone 3-9517
Dallas 2, 1800 N. Market St.	RIverside 5-7144
Fort Worth 1, 408 West 7th St.	EDison 2-8331
Houston 3, 1104 Dowling St.	CApitol 5-0691
San Antonio 5, 902 Frost National Bank Bldg.	CApitol 7-7022
UTAH	
Salt Lake City 1, 136 S. Main St.	EMpire 3-1723
VIRGINIA	
Richmond 19, 700 East Franklin St.	MILton 3-6646
WASHINGTON	
Spokane 17, West 12 Indiana Ave.	FAirfax 7-5181
Seattle 1, 1314 Ave.	MAin 3737
WEST VIRGINIA	
Charleston 1, 179 Summers St.	DIckens 3-9503
WISCONSIN	
Apeleton, 1000 West College Avenue	REgent 4-4577
Milwaukee 3, 2040 West Wisconsin Avenue	WEst 3-1756
CANADA	
Calgary, Alberta, 709-8th Ave. W.	23880
Moncton, N. B., 232 St. George St.	EVERgreen 4-9898
Montreal, Quebec, 4104 St. Catherine St. W.	WEllington 7345
Port Arthur, Ontario, 12-A Court Street S.	Phone 3-7632
Toronto, Ontario, Post Office Box 280, Adelaide Street P. O.	
Vancouver B. C., 1200 W. Pender St.	EMpire 4-0486
Winnipeg, Manitoba, 56 Albert St.	MUtual 1-3496
	92853-3

Distributors in all principal cities throughout the United States.
Offices and distributors located throughout the world.

ALLIS-CHALMERS equipment for the METALLIC MINERALS INDUSTRIES



Allis-Chalmers is the world's largest manufacturer of equipment for the mineral industries. The wide variety of A-C products has brought together one of the most diversified groups of engineering specialists in all industry. That means you can get expert equipment recommendations from A-C.

There's no guesswork when you specify Allis-Chalmers Engineering. The A-C staff, working with your staff, analyzes your problem or process and looks for ways to make existing equipment "team up" with the new equipment for greater production. And the recommendation will be unbiased, because A-C builds many types and sizes of equipment. The selection will be dictated by exactly what you need, not an improvised arrangement.

Trained engineers in the Allis-Chalmers Research Laboratories help solve tough problems by testing samples of your product. This is another precaution to make sure that exactly the right equipment is selected for your particular plant.

And Allis-Chalmers not only builds the basic machinery, but also the motors, drives and control needed to run it—it is the only company that builds all this machinery in its own shops. This means a "packaged" unit or process, with every part engineered to work efficiently with every other . . . assures you of higher efficiencies, lower costs, undivided responsibilities. And Allis-Chalmers stands behind every unit 100%!

ALLIS-CHALMERS

969 South 70th Street, Milwaukee, Wisconsin



25 C 7949F

VIBRATING SCREENS... a complete line

SELECTION GUIDE for metallic minerals industry

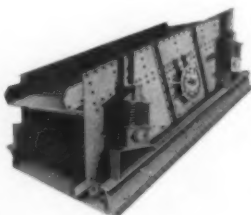
Vibrating Screen Applications	Maximum Feed Size (inches)	Aperture Range (inches)	Screen	Common Sizes (feet)
Scalping—ahead of Jaw Crushers.....	36	3 to 10	ROM Model XXH	5 x 10 to 6 x 14
Scalping—Following primary crushers.....	20	1 to 10	Model XH	4 x 5 to 6 x 16
Scalping—Following secondary crushers or hammermills.....	6	¼ to 5	Model SH	3 x 6 to 6 x 16
Dry Sizing.....	6	40 mesh to 5	Model SH	3 x 6 to 6 x 16
Dry Sizing.....	5	½ to 2½	Low-Head	3 x 6 to 8 x 20
Dry Sizing.....	4	40 mesh to 3	Model S	3 x 6 to 4 x 10
Dry Sizing.....	4	40 mesh to 1½	Model AVS	3 x 6 to 4 x 10
Wet Sizing and Washing.....	6	40 mesh to 5	Model SH	3 x 6 to 6 x 16
Wet Sizing, Washing and Dewatering.....	5	¼ mm to 2½	Low-Head	3 x 6 to 8 x 20
Wet Sizing.....	4	40 mesh to 3	Model S	3 x 6 to 4 x 10
Wet Sizing.....	4	40 mesh to 1½	Model AVS	3 x 6 to 4 x 10
Media Recovery and Washing.....	8	¼ mm to 2 mm	Low-Head	3 x 12 to 8 x 20
Thickening, Dewatering and Filtering.....	¾	¼ mm to 1 mm	Low-Head	3 x 12 to 8 x 20

STANDARD ALLIS-CHALMERS VIBRATING SCREENS

Model XXH ROM inclined screens

For the heaviest scalping problems

Model XXH ROM screens are of heavy steel construction with balanced, two-bearing cartridge-type mechanism. May be obtained with plate or stepped grizzly bar decks. Max. opening—10 to 11½ inches... 1 or 2 decks. Send for Bulletin 07B8368.



Model XH Extra Heavy Duty inclined screens

For wet or dry scalping and coarse sizing

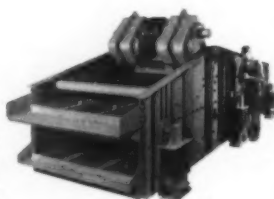
Model XH *Ripl-Flo* screens have balanced two-bearing mechanisms and may be obtained with perforated plate, rod or stepped grizzly bar decks. Max. opening—10 inches... 1, 2 or 3 decks. Send for Bulletins 07B6151 and 07B7868.



Low-Head Heavy Duty horizontal screens

For moderate to heavy sizing, coarse to fine, wet or dry, thickening dewatering, media recovery and rinsing.

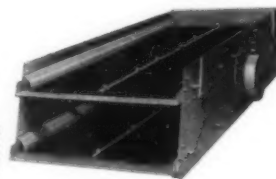
Low-Head screen operation saves headroom and space. Conveniently mounted mechanism imparts a straight line motion to screen. Max. opening—2½ inches... 1, 2 or 3 decks. Send for Bulletins 07B6330 and 07B7868.



Model SH Standard Heavy Duty inclined screens

For moderate to heavy sizing, coarse to fine, wet or dry, light scalping and rinsing

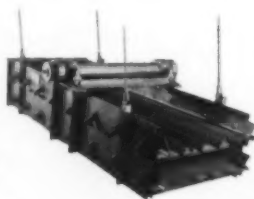
Model SH *Ripl-Flo* screens have balanced, two-bearing mechanism and are designed for a wide range of applications. Max. opening—5 inches... 1, 2 or 3 decks. Send for Bulletins 07B6151 and 07B7868.



Model AVS Standard Duty inclined screens

For fine sizing, wet or dry

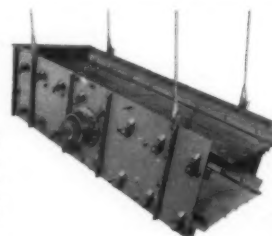
Model AVS *Aero-Vibe* screens have two-bearing mechanism located above the body. Gives top screening efficiency at lowest possible cost. Max. opening—1½ inches... 1, 2 or 3 decks. Send for Bulletin 07B6099.



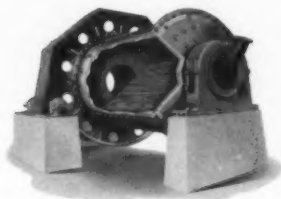
Model S Standard Duty inclined screens

For moderate, wet or dry sizing

Model S *Ripl-Flo* screens are sturdy, low cost screens... have two-bearing mechanism. Max. opening—3 inches... 1, 2 or 3 decks. Send for new Bulletin 07B8229.



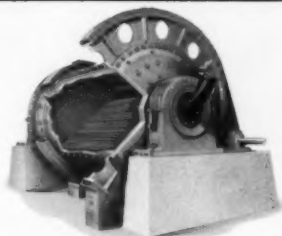
GRINDING MILLS . . . all types



Overflow Rod Mill

Sizes 3 to 11½ ft diameters, 6 to 16 ft lengths. Rod mill product can be varied from 6 to 35 mesh, with a minimum amount of fines. Because a rod mill can reduce a one inch slot size feed, it has supplanted the last stage of crushing in many plants. The screening action of the rods within the mill produces an ideal ball mill feed, free from tramp oversize, without the use of close circuiting screens.

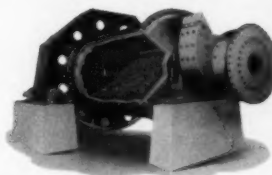
Bulletin 07B6718.



Peripheral Discharge Rod Mill

Sizes 3 to 11½ ft diameters, 6 to 16 ft lengths. The peripheral discharge rod mill was developed for those dry grinding circuits where close control is required for either the product top size or the fines. In addition to these dry grinding applications, either the end peripheral or the center peripheral discharge rod mill may be used in wet circuits where specific product requirements must be met.

Bulletin 07B6718.



Ball Mills

Sizes 3 to 13 ft diameters, 3 to 17 ft lengths. For producing a finely ground product of 28 to 325 mesh from a feed size of about ½ inch. Ball mills are unsurpassed for the fine grinding of moderately to extremely abrasive materials.

Overflow type ball mills are used for fine wet grinding in closed circuit with a classifier. Diaphragm type ball mills are universally used for fine or coarse, wet or dry grinding in closed circuit with a classifier, screen or air separator.

Bulletin 07B6718.

PYRO-PROCESSING EQUIPMENT

ROTARY KILNS . . .

For sintering, nodulizing, pelletizing, agglomerating, calcining

AIR QUENCHING GRATE COOLER

CONVERTERS

BALLING DRUMS

ROTARY COOLERS, DRYERS

HOLDING FURNACES

WASHING EQUIPMENT

CONTINUOUS CONTACT COLUMN

BLADE MILLS

LOG WASHERS

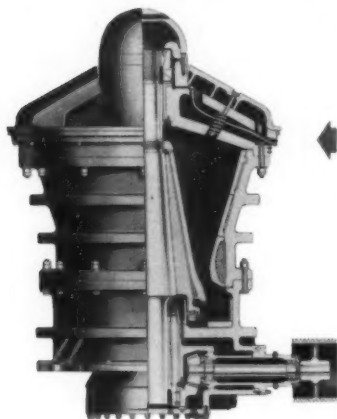
MATERIALS HANDLING EQUIPMENT

CAR SHAKERS

TRACTORS AND GRADERS

MOTOR WAGONS

CRUSHERS FOR EVERY MINING JOB



Superior Gyratory Crushers

For high capacity primary or secondary crushing

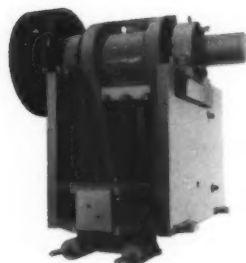
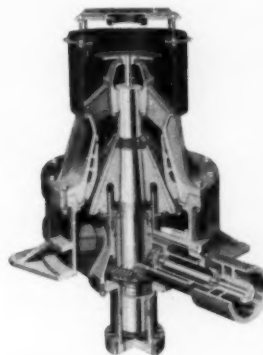
Twelve sizes . . . 16-50 to 60-109 (60 inch feed opening, 109 inch diameter cone at crushing point). Capacity 170 to 3500 tph. Available with *Hydroset* mechanism or spider suspension. Bulletin 07B7870.

Hydrocone Gyratory Crusher

For high capacity secondary or tertiary crushing

Twenty-one sizes . . . 122 to 1784 (17 inch feed opening, 84 inch diameter cone at crushing point). Capacity 7 to 1050 tph. Equipped with *Hydroset* mechanism. Bulletin 07B7145.

The *Hydroset* mechanism adds flexibility to gyratory crushing . . . an hydraulic mainshaft support which compensates for wear, adjusts product size and facilitates clearing of crusher in case of power failure or unexpected shutdown.



Model ST Jaw Crusher

For crushing moderately hard material with minimum fines

Five sizes . . . 18x30 to 42x54 inch feed openings. Capacity, 75 to 650 tph. Bul. 07B8595.

A-1 Jaw Crushers

For primary crushing of tough, abrasive material in blocky feed sizes

Four sizes . . . 36x25 to 60x48 inch feed openings. Capacity, 200 to 660 tph.

Bulletin 07B6369.

Blake Jaw Crushers

For moderate capacity crushing of hard materials

Five sizes . . . 10x7 to 30x18 inch feed openings. Capacity, 6 to 90 tph. Bulletin 07B7090.

Fine Reduction Jaw Crusher

For crushing 7 inch and smaller feed to 50% passing ¼ inch in one operation

Two sizes . . . 18x9 and 24x10 inch feed openings.

Bulletin 07B6425.

Roll Crushers

For fine crushing of hard material with minimum fines

Double-roll crushers are driven by large flywheel sheaves. Roll diameters from 9 to 78 inches. Bulletin 07B6180.

For crushing large tonnages of laminar rock

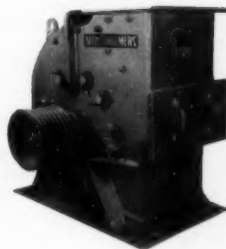
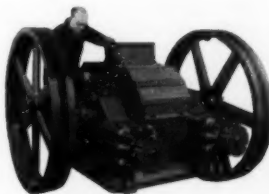
Single roll *Fairmount* crushers, two sizes . . . 24x84 and 36x60 inch rolls. Write for more information.

Pulverator Hammermill

For pulverating non-abrasive materials

Hammers reduce material by multi-impact . . . large ratio of reduction. Handles up to 4 inch feed. Five sizes . . . capacity 2½ to 125 tph.

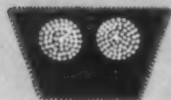
Send for Bulletin 07B6265.



A DRIVE FOR EVERY MACHINE

Texrope—greatest name in V-belt power transmission—is the registered trademark of Allis-Chalmers, originator and pioneer of multiple V-belt drives.

Ask for Bulletin 20C6051, "Handy Guide to Selection of Texrope Drive Equipment"; it tells the complete Texrope Drive story . . . V-belts . . . sheaves . . . and how to figure a Texrope drive.



Grommet Belt



Wide Range Belt

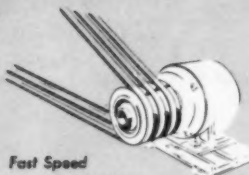
Texrope V-belts

Famous patented grommet construction provides longer life than ordinary V-belts. Made with straight sides for greater grip. Types for all operating conditions: heat-resisting; oil-resisting; static-resisting and special High Capacity. Also available: Texrope wide range V-belts for use with wide range Vari-Pitch sheaves and Vari-Pitch Speed Changers.

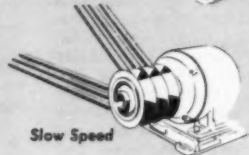


Magic-Grip Sheaves

MAGIC-GRIP cast iron sheaves are designed for fast easy mounting and demounting. Construction is simple . . . foolproof. Sheave can be installed in shortest possible time. Cuts maintenance costs . . . reduces downtime to minimum. Automatically adjusts itself to slightly oversize or undersize shafts. Positive clamp-fit on shaft. Sheave can be mounted close to motor or machine . . . reducing bearing pressure, increasing bearing life. Stock sizes for drives up to 200 hp . . . larger sizes available on order.



Fast Speed



Slow Speed

Adjustable Sheaves and Speed Changers

VARI-PITCH SHEAVES are available in two types; Standard Range for A, B, C, D or E belts—capacities from 1 to 300 hp—speed variations up to 40%. Wide Range for Q and R belts—capacities from 1½ to 40 hp—speed variations up to 100%. Both types designed with stationary or motion control features—Stationary Control for infrequent changes when sheave is stopped; Motion Control for repeated speed changes while sheave is in motion.

VARI-TEX SPEED CHANGERS furnish up to 4-1 ratio in one compact, enclosed unit. Adjustable while in motion. Combines two wide range, worm gear-adjusted sheaves. Manual or pushbutton control.

MOTORS FOR EVERY DRIVE

SUPER-SEAL MOTORS are one of the latest cost saving developments to come from Allis-Chalmers. These motors are built in two general types. One of them is insulated with **Silco-Flex** all-silicone-rubber insulation that has extreme resistance to dust and moisture and is repellent to surface water. The other has stators molded in epoxy-resin which provides a permanent shield against moisture and contamination. Open type Super-Seal motors may be used in most applications that formerly required enclosed motors. They are available from the smallest to the largest ratings. Bulletin 51B9040.



DRIP-PROOF—New NEMA rated squirrel cage motors are available in standard ratings starting at ½ hp. Their better protection against foreign matter helps keep maintenance costs low. Bulletin 51B6210.



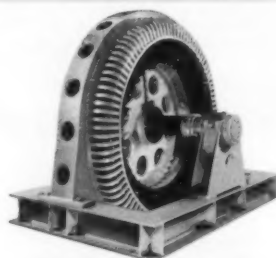
TOTALLY ENCLOSED FAN-COOLED—Ideal for dirty, dusty, oily, humid, corrosive, and outdoor locations. Rapidly moving air from the cooling fan keeps most dirt from settling on motor. Easily cleaned. 51B7725.



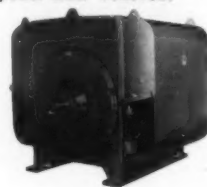
LARGE CAGE MOTORS—Built in sizes to meet all industrial, power plant, and special application requirements. Construction shown is available from 60 hp at 300 rpm to 2000 hp at 1800 rpm. 05B7542.



WOUND-ROTOR MOTORS—For constant speed duty requiring frequent reversing or starting under heavy load. Adjustable-varying speed loads. High starting torque applications, such as crushers, kilns, blowers. 51B8195.



SYNCHRONOUS—Built in ratings from 40 hp up for a wide variety of speeds, including 3600 rpm motors in the larger sizes. Have high efficiency. Improve plant power factor for reduced power costs. 05B8183.



WEATHER-PROTECTED—Design simplicity and the ability to operate under the most severe weather conditions are combined in this weather protected motor. Sizes from 250 hp up. Bulletin 51B8606.

CONTROL FOR EVERY MOTOR

Allis-Chalmers makes a line of starters to meet practically all motor control needs. Count on this wide range of starters, backed by industry-wide application engineering experience, for the answer to your control needs. Ask for Bulletin 14R7988.



Power Distribution

Allis-Chalmers also supplies a complete line of power distribution equipment to mining plants. This includes power distribution, and instrument transformers; indoor and outdoor switchgear and unit substations; circuit breakers; power rectifiers.

Tractor Equipment

Allis-Chalmers has geared its development progress to the earth moving and material handling needs of the mining industry and is supplying crawler tractors, tractor shovels, pull scrapers, motor scrapers, motor wagons, motor graders and power units.

ALLIS-CHALMERS

969 South 70th Street, Milwaukee 1, Wisconsin

LITHO IN USA

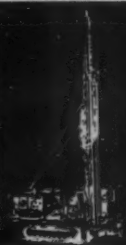
A Constant Standard of Quality in

EVERYTHING YOU NEED FOR DRILLING ROCK



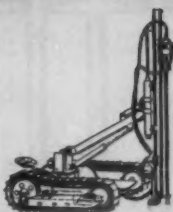
DRILLMASTERS

The most productive and versatile primary blast-hole drill ever developed. Completely self-powered and self-propelled. For rotary drilling or percussion drilling with the revolutionary I-R Downhole drill.



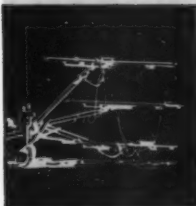
QUARRYMASTERS

The big blast-hole drilling rig for heavy-duty service in mines or quarries. Completely self-powered and self-propelled. Can be used as a percussion drill or rotary drill simply by interchanging drill units.



CRAWL-I-R DRILLS

The most rugged and completely mechanized crawler drill obtainable. All drill-tower motions hydraulically controlled, converting setup time into drilling time. Tows its own portable air compressor.



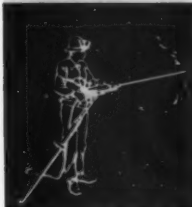
HYDRA-BOOM DRILLING RIGS

Mechanized rock drilling at its rugged best. Heavy-duty hydraulic booms and power-feed drifters for tractor, truck or jumbo mounting. Save manpower—increase production—cut drilling costs.



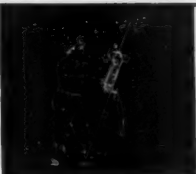
WAGON DRILLS

Versatile and powerful wheeled units, manually adjustable for drilling in any position. Heavy-duty FM-4 Wagon Drill and light-weight JHM Wagonjack.



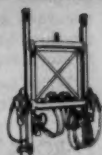
UNIVERSAL JACKDRILLS

The first completely integrated Jackleg drill ever developed. Telescopic feed leg gives full 6-foot feed from an easily-handled 3-foot leg. Five-position throttle and roll-type feed leg valve simplify operation.



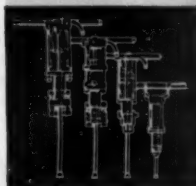
VACUJET STOPERS

The dustless I-R stopper drill with built-in jet suction and pressure discharge for fast, clean roof bolting jobs. Only a canvas bag dust collector needed. Use with I-R carset bits and I-R carburized drill steel.



DUAL-DRILL RIGS

Suspended from a side boom tractor, the Dual Drill Rig drills two holes at a time in any trench pattern. Rugged framework mounts dual heavy-duty drifters with long feed. Ideal for pipeline and trench drilling.



JACKHAMERS

A complete line of hand-held percussion drills. A size, weight and drilling power to meet the specific requirements of any job to best advantage. Known the world over for stamina and dependability.



CARSET BITS

The tungsten-carbide insert bit pioneered and perfected by Ingersoll-Rand. High sustained drilling speed in any type of ground. Shoulder drive, bottom drive or tapered socket bits in sizes from 1 1/4" to 4". Downhole-drill bits from 4 3/4" to 9".



PAVING BREAKERS

The most complete line of demolition and digging tools available. Six basic sizes, from heavy-duty R-30 slag breaker to light-weight J-10 utility tool. Also a complete line of precision made accessories.



AIR COMPRESSORS

From the world's largest manufacturer of Compressors;—Gyro-Flo portable air compressors from 85 cfm to 900 cfm—Stationary air compressors from 1 hp to 6000 hp.



AIR-LINE LUBRICATORS

Assure proper lubrication for longer life and reduced maintenance of all air-powered rock drills and paving breakers. Operate in any position—automatically feed right amount of atomized oil into air line.



BIT AND ROD SHOP EQUIPMENT

Bit grinders, shank grinders, steel cutters, steel sharpeners and bit and rod furnaces, designed and built by rock drill experts. Everything you need for a well-equipped bit and rod shop.

Your I-R representative is a skilled specialist with wide experience in every phase of rock drilling. Call him whenever you want assistance or advice.



Ingersoll-Rand

5-949

11 Broadway, New York 4, N. Y.

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR ROCK DRILLING

CATALOGUE, SURVEY & DIRECTORY NUMBER, 1959

235

THE W. S. TYLER COMPANY

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Philadelphia 7, Pa.
Lincoln-Liberty Bldg.

Atlanta 3, Ga.
Hurt Building

Dallas 1, Texas
Republic National Bank Bldg.

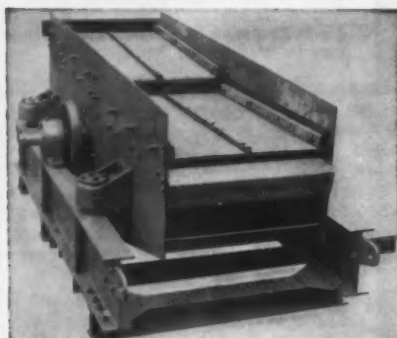
San Francisco 4, Calif.
Russ Bldg.

Los Angeles 57, Calif.
2404 W. Seventh St.

Canadian Plant & Office—St. Catharines, Ontario



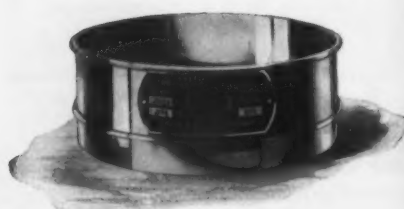
Ty-Rock Screen (Discharge chutes removed to show material)



Tyler-Niagara Screen



Hum-mer Screen



Tyler Standard Screen Scale Testing Sieve

WOVEN WIRE SCREENS

Supplied in all meshes and metals and for all purposes. Tyler Woven Wire Screen is noted for its accuracy and dependability. More than 7,000 specifications are manufactured, many of which are kept in stock ready for immediate shipment.

Write for Catalog 74, Specification Tables of Tyler Woven Wire Screens.

TY-ROCK SCREENS

This full-floating circle-throw screen combines immense capacity with low operating costs—especially for coarse and medium sizing. This is the ideal screen wherever huge tonnages of coal is handled and where flat or low angle screening is desired. Send for Catalogue 65.

TYLER-NIAGARA SCREENS

High-speed circle-throw screens for economical screening of coal products. Send for Catalogue 64.

TY-ELECTRIC HEATED SCREENS

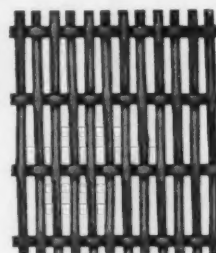
The Ty-Electric System of electric heating of Ty-Rock & Hum-mer Screens represents the most recent development in screening damp materials. The woven-wire screens are heated by passing electric current through the wires. Heat keeps the surface of the wire dry so that fine damp particles will not stick on the wires and blind the openings. Send us details of your damp screening problems so we can make recommendations.

TYLER HUM-MER SCREENS

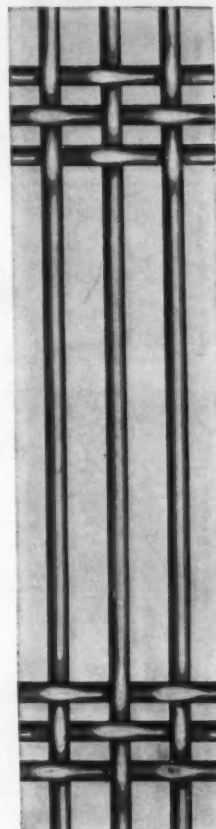
The Hum-mer was the first electrically vibrated screen and is still, by far, the lowest in operating cost for accurate sizing of medium and fine material. The Hum-mer employs less than one H.P. per vibrator and is furnished in one, two or three deck units in both open and closed models. Send for Catalogue 63.

TYLER TESTING SIEVES AND TESTING SIEVE SHAKERS

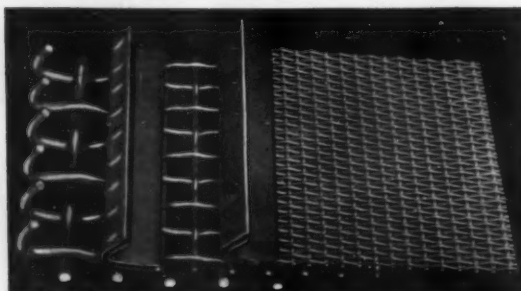
Tyler Standard Screen Scale Testing Sieves are the accepted standard for sieve testing throughout the world. The Ro-Tap Testing Sieve Shaker and the Ty-Lab Tester assure comparable, accurate data. Send for Catalogue 53.



Ton-Cap Screen Cloth




Ty-Rod Screen Cloth



Tyler Hook-strip and bent edge for screen sections



Ro-Tap Testing Sieve Shaker with Tyler Sieves



HIGH MAINTENANCE COSTS ARE DOOMED...

when you use ultra-flexible TIREX® trailing cords and cables. Simplex TIREX cords and cables are built to "take it." In snow and mud, under water and under pressure, TIREX remains flexible, smooth, light and easy to handle, due to its original cured-in-lead construction. TIREX cords and cables, with tempered and fortified neoprene armor, assure balanced resistance to abrasion, water, acids, oils, sunlight and flame.

Whatever your power-transmitting applications—mobile mining equipment, construction machinery or portable tools—you can depend on TIREX.

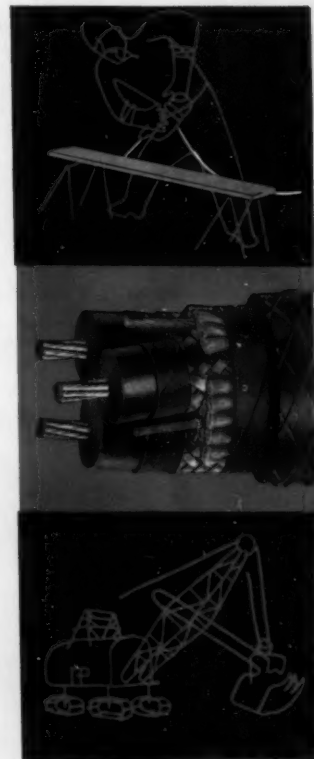
"Built like the finest, toughest automobile tires."

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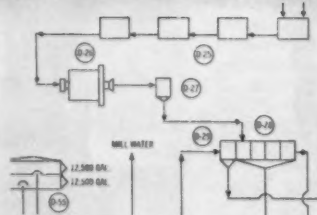




LABORATORY ORE INVESTIGATION determines the best-suited ore-treatment process, guides mill and plant design.



FLOW SHEET DEVELOPMENT shows each processing step in proper sequence, indicates economic feasibility before major investment is made.



KRUPP RENN PROCESS, represented exclusively by Sweco in the U.S., directly reduces lower grade and refractory iron ores in a rotary kiln.



HEAVY-MEDIA-SEPARATION makes possible profitable treatment of many ores. Sweco builds complete heavy media separation plants.



VIBRATING SCREEN SEPARATORS are efficient screening classifiers used in many ore beneficiating processes. Photo shows battery of Sweco Separators at U.S. Borax & Chemical Corporation plant, Boron, California.



PLANT DESIGN, ENGINEERING AND CONSTRUCTION SERVICES of SWECO were utilized by National Lead Company in their lead, zinc and copper concentrating plant high in the Argentine Andes.

GETTING THE MOST OUT OF YOUR ORE

Profitable ore treatment is the objective of all operators of milling plants. SWECO engineers, technicians and craftsmen have been helping mining companies reach this objective for more than 40 years. This experience extends to every known type of ore and to the far corners of the world... from laboratory investigation and flow sheet development, to the complete design, construction and operation of ore beneficiating plants... from small-scale pilot operations, to massive installations. *To get the most from your ore, call on this SWECO experience.*

LITERATURE AVAILABLE ON REQUEST:

- SWECO Engineering and Construction Services, Bulletin MC-1
- SWECO Ore Investigation Services, Bulletin MC-2
- SWECO Krupp Renn Plants, Bulletin MC-3
- SWECO Heavy-Media-Separation Plants, Bulletin MC-4
- SWECO Vibrating Screen Separators, Bulletin MC-5

40 years of service to the mining industry



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Engineers—Constructors—Manufacturers

THE DEISTER CONCENTRATOR COMPANY

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PRODUCTS

The Original Deister Company—Incorporated 1906
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50 YEARS EXCLUSIVELY ENGAGED IN THE MANUFACTURE OF SEPARATING AND SIZING EQUIPMENT

SuperDuty® DIAGONAL-DECK® CONCENTRATING TABLES



New!

Models HCCD and HCRD provide doubling of discharge capacity for high gravity components of a table feed. (Patented)

DIAGONAL-DECK Tables

Our DIAGONAL-DECK Concentrating Tables have been accepted as the standard the world over for more than a quarter of a century. Leading this line of outstanding and time proven tables is the *SuperDuty* DIAGONAL-DECK table, firmly established by substantial commercial applications as the most advanced in features, performance and practical advantages.

THE *SuperDuty* TABLE

- OFFERS HIGHER CAPACITY—Small middling loads, a direct result of the DIAGONAL-DECK table design, plus greater efficiency of CONCENCO® Head Motion means more tons of new feed handled per day per table.
- SURPASSES IN RECOVERY any other concentrating table built while maintaining comparable or higher feed and product capacity.
- MAKES HIGHER GRADE PRODUCTS because "fanning out" action of the DIAGONAL-DECK table design permits more accurate cutting of product yield.
- YIELDS THE GREATEST PROFIT by its overall efficiency in performance and matchless operating economy.
- REQUIRES ONLY 2 H.P. Motor on the No. 6 Ore Table for starting and substantially 1/2 H.P. under continuous operation. The No. 7 Coal Washing Table requires only a 3 H.P. motor to start and substantially 1 H.P. under continuous operation.
- OFFERS A RECORD MAKING HEAD MOTION. The CONCENCO Anti-Friction Head Motion is a modern, efficient mechanism far ahead of the field. First in application of anti-friction bearings, its leadership has been maintained over two decades. Outstanding performance is fully verified through field-wide acceptance.
- IS THE SMOOTHEST AND EASIEST RUNNING table ever built, by virtue of its sturdy balanced supports, deck operating design and outstanding head motion.
- IS A COMPLETE MACHINE—embracing more than just a head motion, deck and a few slide bearing units requiring the addition of adequate frame and support elements to build into a finished and properly aligned machine that can be completed only at user's full responsibility and extra expense.
- CANNOT BE EQUALED FOR LOW COSTS in operation and maintenance.
- IS DEFINITELY OUT IN FRONT as your best, safest and most profitable choice considering both your investment and operating dollars.



SuperDuty DIAGONAL-DECK Ore Tables

Minerals—Metallic—For the recovery of mineral values from gangue, for the differential separation of complex minerals, DIAGONAL-DECK Deister-Overstrom Tables long proved their value. A logical development from these sturdy forerunners, the *SuperDuty* DIAGONAL-DECK Concentrating Table is today proving itself the most highly developed and successful wet gravity concentrating apparatus in the world's leading mills. Used ahead of flotation, these tables effectively eliminate barren coarse gangue and reduce the tonnage for fine grinding; relieve the pulp of a large part of the mineral load and lessen the burden on the more intricate flotation process. Following flotation, tables are used to recover the tarnished, oxidized or carbonate mineral particles that are so ineffectively recovered by flotation.

SuperDuty DIAGONAL-DECK Tables used as pilots in flotation guide the operator in regulating the flotation oils and reagents. Pilots are used on concentrates, middlings, intermediate products, tailings and are placed in various parts of the flow-sheet.

On carbonate or oxidized ores especially, these tables have proven the simplest and most economical method of concentration.

Minerals—Non-Metallic—The use of tables on non-metallic minerals is now general. For the separation of silica, feldspar, iron and granular particles from kaolin and in the recovery of mica, garnet, silica, cyanite, barytes, fluorspar, phosphate, potash, etc., tables have proven their commercial value. *SuperDuty* DIAGONAL-DECK Tables are used successfully on the most difficult separations; for example: the differential concentration of barite-iron-silica or garnet-silica-mica.

Recovery of Values from Residues—The residual sands and ashes resulting from operation of brass and other metal foundries have a high metallic content. Formerly this sand was washed by hand and an inefficient recovery made. *SuperDuty* tables are now used on foundry residue and efficient recovery is made of even the very finest metallics. Copper, brass, tungsten, zinc and many other metals are recovered from waste materials at a substantial profit.

WRITE FOR CATALOGS

Patents on equipment owned or controlled by The Deister Concentrator Co. Trade-marks registered in U.S. and foreign countries.

CATALOGUE, SURVEY & DIRECTORY NUMBER, 1959

SuperDuty DIAGONAL-DECK Coal Washing Tables

The SuperDuty DIAGONAL-DECK Table cleans either bituminous or anthracite coal. Although most widely used on the sizes finer than $\frac{1}{4}$ ", installations on sizes up to $1\frac{1}{4}$ " are eminently successful. Conversely, because of ultra mobility and smoothness of deck operation, effective work is now possible on extremely fine sizes—within the minus 48 mesh range. Clean coal is being recovered in many instances from the refuse products of other coal cleaning devices, both with and without recrushing. Another source of table feed is the undersize from dewatering screens which follow other coal cleaning machines. Reject materials forming culm banks, river deposits and waste piles may in many instances be reclaimed. In fact, the SuperDuty table may be used on any cleaning problem where there is a specific gravity difference between relatively free particles of coal and refuse.

Design—SuperDuty DIAGONAL-DECK Coal Washing Tables are designed for efficient cleaning of coal, especially those sizes which jigs and similar machines fail to handle efficiently and profitably.

Installation—DIAGONAL-DECK Coal Washing Tables may be installed singly or in battery. Number of tables required is governed by tonnage to be handled. Tables in battery installation operate as independent units, consequently, individual tables may be cut in or out to meet variations in production schedule profitably.

Investment—SuperDuty DIAGONAL-DECK Coal Washing Tables represent the lowest initial investment regardless of size of installation. These tables meet the requirements for efficient cleaning, low operating costs and production flexibility.

Operation—This process, employing wet gravity principles, offers the greatest simplicity in operation, while full visibility of separation accounts for the finest results by unskilled attendants.

No other process can equal their performance on sizes $1\frac{1}{4}$ " to finest dust. High efficiency is attested by their elimination of 90% or better of the free impurities including slate, sulphur, pyrite, shale, fire clay, gravel, bone and tramp iron. Simultaneously loss of coal to refuse is minimized beyond the possibilities of other processes.

Capacities—of DIAGONAL-DECK tables run from 4 to 20 tons per hour, depending on type and size of coal, washability and cleaning requirements.

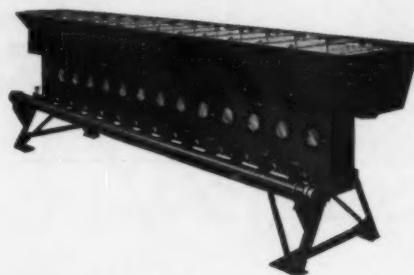
New Specialized Models—The new Models HCRD and HCCD are specialized designs of the No. 7 and No. 6 sizes, respectively, of the SuperDuty DIAGONAL-DECK Concentrating Table. In these models, that portion of the deck periphery available for discharging high gravity feed components is doubled, without subtracting from the low-gravity discharge periphery, thereby doubling available high-gravity discharge capacity, with attendant increase in table feed capacity. These models are intended for the high capacity handling of feeds wherein the high-gravity fraction represents a relatively large percentage of the total. Phosphate rock, coal and the ores of iron and chrome provide typical fields for application. For other feeds, wherein the high-gravity fraction represents a relatively small percentage of the total, the well known, regular models of SuperDuty DIAGONAL-DECK Concentrating Tables are applicable, as in the past.

CONCENCO® DISTRIBUTORS

The CONCENCO Revolving Feed Distributor, built in six types, is a heavily fabricated, all steel machine with motor drive requiring only $\frac{1}{4}$ H.P. in operation. The Distributor effects perfectly a splitting of feed sluiced to its revolving tank, into any desired number of equal portions from two to sixteen, in some cases more. It is especially suitable for efficiently feeding any number of circuits or machines in battery for higher overall efficiency. It is unexcelled for feeding concentrating tables.



CONCENCO® CPC Classifiers



CONCENCO Constriction Plate Classifiers of all steel welded construction are furnished in any number of cells from 2 to 14 to meet requirements. Each cell is square in horizontal cross section and consists of three chambers: the pressure chamber at the bottom; the sorting column immediately above and separated from the pressure chamber by a constriction plate; and the launder section above the sorting column, which is materially increased in cross section to reduce velocity of flow.

CONCENCO® Super Sorter

Giant High Tonnage
Multiple Spigot Classifier

Patented



The CONCENCO SuperSorter does what engineering opinion had formerly held to be impossible . . . it sorts granular materials hydraulically into a number of uniform, graded products on a low cost, high tonnage basis. The barriers of the past have been overcome in the CONCENCO giant classifier, which maintains teeter and zone densities hitherto considered impossible in large cell cross-sections needed for handling substantial capacities.

Applications

The CONCENCO SuperSorter meets that long-felt need for a multiple spigot, rising current classifier of sufficiently high capacity to handle economically coal, sand, iron ore, phosphate rock and similar granular minerals.

Capacities and Performance

In a battery of four 8-cell units placed in successful commercial operation over ten years ago, classifying $\frac{1}{4}$ " x 0" feed to a large battery of coal washing tables, each SuperSorter unit handled in excess of 100 tons per hour, demonstrating phenomenal performance for both tonnage and efficiency. In the production of concrete sand, to the strictest engineering specifications, the SuperSorter has proved eminently successful. On minus 8 mesh sand, an 8-cell unit produces 130 tons per hour of accurately classified products.

Dimensions

The size and proportions of the CONCENCO SuperSorter may be quickly visualized from the following general data covering the 8-cell machine. The overall height, including 6" H-section supporting legs, is 14 feet. It is 6 feet wide and 40 feet long. Approximate weight, empty, is 16 tons.

Operation

A feature of the CONCENCO SuperSorter is the innovation for control of spigot discharge. Each classified spigot product is intermittently drawn off, with measured precision, from a quiescent bed at the bottom of the cell. High capacity discharge of product is maintained with minimum water content and without disturbing the rising water currents or unbalancing classification in the sorting column immediately above. The novel constrictor valve mechanisms that control the draw-off from each cell are readily adjustable in operation over a wide operating range from open 90%, to closed during 100% of each cycle. The Constrictor valves permit a positively measured and uniform discharge rate from each cell—a condition essential to the high efficiency of the SuperSorter and to overall efficiency when operating in conjunction with concentrating tables or similar devices.

Water and Power Requirements

Water requirement is low for apparatus of this type. Hydraulic water is brought to the individual cells by means of a 12" header pipe and regulated with easily adjustable pinch valves. The only power required is for actuation of the tandem operated constrictor valve mechanism. A 1½ horsepower motor with gear reducer amply provides for even the largest multiple cell units. There being no other moving parts, operating costs are amazingly low.

Range

CONCENCO SuperSorters are now available in a range of sizes to meet the needs of any high tonnage classification problem. The individual cells are incorporated with a rectangular, partitioned tank provided with feed entry, adjustable overflow weirs and overflow exit. All construction is of heavy type.

THE Leahy® SCREEN . . . New Model E Now Available with FlexElex Heating of the Jacket

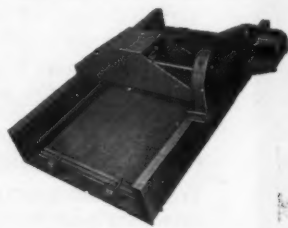
Due to their rugged construction and mechanical simplicity, Leahy Vibrating screens far outdistance other devices in overall equipment life.

The heavy duty vibrator, doubly dust-proofed type and enclosed, and forming an integral part of the structural steel bridge assembly, delivers a stronger and more positive vibration than ever before, superenergizing every square inch of screen jacket with the characteristic stratifying-screening-unblinding vibration, that is so highly acclaimed and profitably enjoyed by Leahy screen users. Leahy differential vibration guarantees open meshes, which in turn insure higher screening efficiency and capacity.

Uses—For wet or dry screening from 3" opening down to fine mesh; also for dewatering and heavy media recovery. Unexcelled for screening at fine meshes.

Features—The new Model E Leahy Screen has simplicity combined with proved ruggedness. Installation is inexpensive, with supports figured for dead load only, because no vibration goes into the screen frame or supports, and only ½ H.P. is used to operate. The heavy duty vibrator, running-in-oil at 265 r.p.m., produces 1200 to 2000 v.p.m. as needed. Maintenance is negligible—averaging less than 1% of first cost annually. Screen jacket economy is reflected in costs as low as \$0.000574 per ton treated. The quickest jacket change feature offered in screening equipment combines with the use of reasonably priced jackets of woven wire and, with some models, perforated plates.

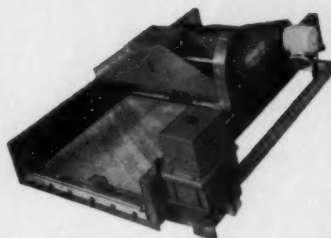
Types and Sizes—Open type, totally enclosed dustproof type; single or double surface; belt drive or motor drive



The Guaranteed Screen

in sizes: 17x32 in.; 2x4 ft.; 3x5 ft.; 3x6 ft.; 3x7 ft.; 4x5 ft.; 4x6 ft.; 4x7 ft.; 4x8 ft.; 5x6 ft.; 5x7 ft.; 5x8 ft. Size designation indicates the overall dimensions of the screen jacket. *Special sizes built to order.*

FlexElex® Electric Heating of Wire Screen Cloth



The FlexElex heating arrangement is engineered especially for fine mesh screening of damp materials such as ores, fine coal, clays, shales, pulverized limestone, chemicals, etc.

A low voltage, high amperage electric current is passed through the screen cloth, causing it to heat sufficiently

that the wires are kept warm and dry, to prevent any build-up of dust-size fines that contribute to blinding.

When the advantages of FlexElex heating are added to the Leahy unblinding action for disposing of intermediate size particles, the result is an efficiency and capacity never before achieved in the screening field. Screening at an accustomed mesh, capacity is stepped up to an astounding degree. On the other hand the same capacity may be maintained with smaller mesh openings formerly considered impractical.

DESCRIPTION. The FlexElex electric jacket heating system for the average size Leahy Screen comprises: a 15 KVA dry type single phase transformer with line voltage primary and low voltage secondary, complete with controls for close adjustment of current and heat used. Short runs of high capacity aluminum bus bars connecting transformer to aluminum mounting bars at jacket eliminate flexible cables or connections in the heating circuit. Highest electrical and thermal efficiency is assured by the most practical design of circuit with bus bars of generous cross section in laminated assembly with airgap spacing.

POWER REQUIRED for the average size screen amounts to only 9 or 10 KVA under normal temperature and moisture ranges. With the FlexElex system it is easy to regulate the current to meet day to day or season to season operating conditions with optimum results at minimum power consumption.

SCREEN JACKET CHANGE TIME. Screen jacket changes can be made with the same ease as with conventional type Leahy Screens. Furthermore, jackets need not be changed as often. Field experience shows that even with less expensive grades of cloth, the life of electrically heated jackets, requiring no beating or brushing, is several times that of unheated cloth.

OVERALL ECONOMICS. Users say that the elimination of attendants for cleaning screen cloth, as well as materially reduced power consumption for grinding (resulting from the accompanying reduction of circulating load, credited to increased screening efficiency of FlexElex equipped screens), generally more than offsets the cost of the equipment and power used to heat the screen cloth.

CONCENCO Spray Nozzle—Water Sprays

CONCENCO Spray Nozzles are unique and efficient. They are easy to apply. A hole is drilled in the pipe and the nozzle bolts on by means of a brass "U" bolt. No threading is necessary. The jet is a flat line spray very effective in washing or screening. The jets can be perfectly aligned one with another for sheet flow washing. The J-132 series with orifices of ¼" to ¾" fit 1" to 2" pipe. The J-136 series with orifices of ⅜" to 1" fit 2" to 4" pipe.



HOW can trim your

Today, many producers of copper, aluminum and other metals are effecting important economies in manpower costs — *through automation of casting and handling equipment*. We know, because, for a large percentage of the most modern installations, Treadwell has prepared the layout, handled the engineering, and built and installed the equipment.

This same experienced assistance is available to you. Here is how Treadwell can help you.

COPPER SMELTING AND REFINING

Wheels for casting anodes, cakes, billets, ingots, ingot bars and wire bars can be supplied for automatic-stop and manual-start operation, with push-button controlled pouring mechanism, and automatic knockout, conveying, spray-cooling, dressing and mold-making equipment. Automatic turnover mechanisms for cakes and billets, and automatic stackers for anodes, ingots, ingot bars and wire bars can also be furnished. Reverberatory, holding, and melting furnaces, converters, converter up-takes and steel flues, ladles and slag cars are designed to meet individual requirements and are carefully matched in capacity to assure efficient production.

STRAIGHT-LINE ALUMINUM CASTING

Treadwell straight-line aluminum casting machines are built for high-speed, low-cost production. Ingots are poured, stamped, spray cooled and conveyed to a stacking machine—all automatically. The stacker nests the ingots,

13'x30' Peirce Smith type copper converters.

Top photo—Wheel for casting copper anodes, furnished by Treadwell, with remotely controlled pouring mechanism, automatic knockout mechanism and anode take-off crane. Cooling, dressing and mold-making equipment also designed and supplied by the company.

Above—38-foot combination casting machine for vertical casting of copper cakes and billets. Shapes are dumped and cooled in the pit at the lower right. Elevating conveyor for delivering cakes to inspection floor is at the far right.



AUTOMATION

costs in smelting and refining

and places them in rows ready for pickup by a lift truck. The spray conveyor cools the ingots so they can be automatically banded as soon as they are stacked.

OTHER METALS AND ALLOYS

In addition to copper and aluminum, Treadwell has designed and built a wide variety of equipment for the production of other non-ferrous metals and alloys. These include lead, nickel, tin, brass, bronze and zinc, among others.

INTEGRATED SERVICES

Treadwell is prepared by experience to undertake complete "turnkey jobs"—including plant layouts, design of buildings and other structures, design of foundations, furnishing all equipment, design of piping and power-distribution and materials-handling systems, complete construction and supervising start-up of the plant.

FOR FURTHER INFORMATION

For a preliminary discussion of your requirements, you name the time and place. A Treadwell sales engineer will be there. In the meantime, send for copies of bulletins describing Treadwell's equipment and services.

M. H. TREADWELL COMPANY, INC.

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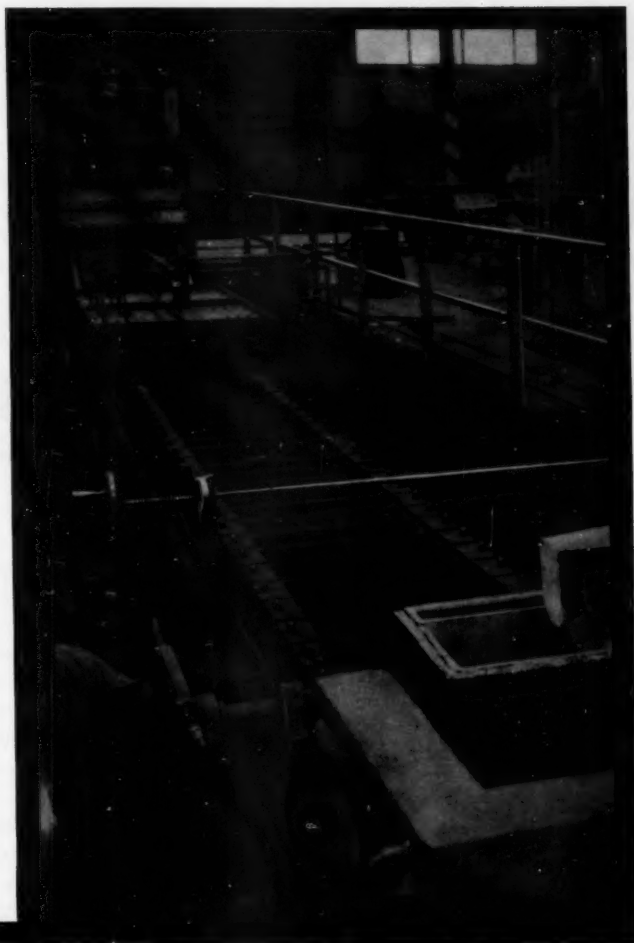
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TR-31

Automatic stacker for
aluminum ingots.

225 cubic-foot slag car.



Straight-line aluminum casting machine with automatic stamping device and stacker. Wheels for casting aluminum cakes are also available.

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*engineering, equipment
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for the mining industry*

CLASSIFICATION

The Dorr Classifier . . . first machine to put classification on a continuous, mechanical basis and still the standard unit for wet separations in the 28 to 200 mesh range. Now available with Type H mechanisms in a complete range of sizes.

The Dorr Bowl Classifier . . . incorporates standard machine with shallow, circular bowl for separations in 65 to 325 mesh range.

The Dorr Hydroseparator . . . for large volume flow or exceptionally fine separations.

The Dorrco Jet Sizer . . . multiple-spigot, hindered-settling classifier featuring low operating cost and extreme flexibility of cell arrangement.

DorrClone* Classifier . . . a complete range of wet cyclones in diameters from 10 mm to 48 in. . . both single and multiple unit installations.

DSM Screen . . . for high capacity screening in the 8 to 100 mesh range . . . gravity fed wedge bar design in standard sizes from 1 to 4 ft. wide. Features high efficiency with low installed and operating cost.

THICKENING

Dorr Thickeners . . . center shaft, center pier and traction units in a wide range of types and sizes to handle every thickening or clarification problem. Individual units available to handle from one to

25,000 tons of solids in feed per day. Can be arranged in trays for counter-current washing, parallel thickening or a combination of both in a single unit.

FILTRATION

The Oliver Filter . . . first machine to put vacuum filtration on a continuous basis and still the standard filter for washing cyanide slurries. Available in sizes ranging from 3 to 790 sq. ft. of filtering area and with a variety of discharge methods depending on cake characteristics.

The American* Filter . . . ideal for dewatering slurries which form relatively thick cakes. Features big savings in floor space and can be compartmented to filter two or more products on the same machine.

The Dorrco Filter . . . low maintenance unit where filtering takes place on the inside of the drum which also acts as the filter tank. Especially suited for dewatering fast-settling solids such as magnetites, lead sulfides, etc.

The Oliver Horizontal Filter . . . capable of counter-current washing in a single unit. Ideal for relatively slime-free slurries which form thick cakes.

The Sweetland* Filter . . . a quick opening batch pressure filter with individual sight glass on each leaf. Good for leaching operations and where % solids in feed is insufficient to form a dischargeable cake on a continuous unit.

ROASTING, DRYING & CALCINATION

Dorrco FluoSolids* Systems ... over 120 units now in operation indicate complete acceptance of advanced technology embodied in D-O's fluidized system for gas-solids reaction. For roasting sulfides for metal recovery, for SO₂ production for acid manufacture, for roasting gold ores prior to cyanidation, for heat treatment steps in the concentration of various ores.

PUMPING

The ODS Diaphragm Slurry Pump ... variable volume pump from zero on up. Discharge can be shut off while pump is running. Operates on compressed air with no mechanical linkage. Ideal for dense slurries.

Dorrco V-Type and W-Type Pumps ... for positive, controlled removal of settled solids from Thickeners and Hydroseparators. Can be used as meters ahead of further treatment.

FOR FURTHER INFORMATION

Literature detailing the different types of Dorr-Oliver equipment and its application to specific operations is available through any of the offices and associated companies listed at right.

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Electrical equipment and supplies to meet the special needs of the mining industry are an important part of Graybar's all-inclusive service. Located at or near leading mining centers, Graybar offices and warehouses serve as prompt local supply sources for the

products of over 300 leading manufacturers. Graybar Representatives in these areas are well informed on underground or above-ground service requirements. Specialists on wiring, lighting, communication, and power apparatus are ready to help you.

430

ELECTRIC CABLE

GRAYBAR offers a complete line of wire and cable for power distribution, for mining machinery and locomotives, shot firing, signaling, and other specialized needs.



Simplex mining machine cable has tough outer selenium-neoprene armor to stand up in mining service.



Tirex shot-firing cable combines flexibility and light weight with high strength.



MOTORS, CONTROLS, FANS

General Electric motors and controls, meeting Bureau of Mines or Underwriters Laboratories requirements for hazardous areas, are available via GRAYBAR as a part of our power apparatus service. Ilg ventilating fans and blowers of all types are also available for mine use.



MINE TELEPHONES

U.S.I. Mine Telephones are sound-powered... require no batteries or external power supply. They transmit speech clearly over lines of any length. Supplied for either code or selective signaling up to 24 stations. U.S.I. Mine Telephones carry Bureau of Mines Approval No. 905.



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GRAYBAR "Victor" tape is a widely used favorite. Weather-proof sockets, fuses, circuit breakers, panel boards, switches, and terminals are among the many additional wiring supplies distributed by Graybar for electrical systems above ground or below.

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Lamps and lighting equipment offered via GRAYBAR include explosion-proof, vaporproof and other specially protected types. Also a full line of floodlights for outdoor service, fluorescents for offices and drafting rooms. Our portables and flashlights are listed by Underwriters Laboratories for Class I, Group D conditions.



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EXPANDING in SERVICES and PRODUCTS

For the Mining Industries

National Mine
Service Company



Seven major
products
distributed
and serviced
exclusively
by
National
Mine



National Mine
TorKar

With operation based on a single prime-mover and torque converter, AC, DC and Diesel-Powered TorKars are establishing new standards of shuttle car performance, with sharply reduced maintenance.



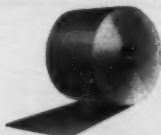
Greensburg
Locomotives

From National Mine's Greensburg Division, a complete range of Monitor Type Storage Battery and Diesel Locomotives from 2 to 15 tons. More pulling power per ton, higher efficiency for every invested dollar.



Wheat National
Electric
Cap Lamp

A major advance in better light for the miner, incorporating significant new developments in battery, bulb and fingertip focussing—resulting in better light, greater utility, better service.



Scandura
Belting

Stronger, lighter and more durable, fire-resistant P.V.C. Scandura is best for the long haul; best for extensibles! More productive because it stays on the job without expensive repair.



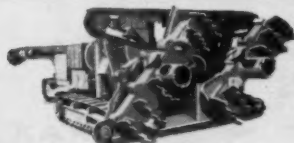
Clarkson Redbird
Conveyor Chains

The leader in conveyor chain performance, with balanced construction providing longer, trouble-free service. Welded flight assembly lessens wear and strain, eliminates need for adjustment. A Clarkson Division product.



Hayden
Belt Fastening
Equipment

Using Tenex Hooks, the small, easily portable 17½-lb. Hayden "Autoclip" makes stronger conveyor belt splices in less time on the job and in limited working space. Material cost 25% lower, labor cost 75% lower—plus economies of reduced downtime.



Marietta
Continuous
Miner

This is a rugged, powerful, caterpillar-mounted, boring-type continuous mining machine of proven high capacity in coal and non-metallic mining—built by National Mine's Clarkson Division.

NATIONAL MINE SERVICE COMPANY

Koppers Building · Pittsburgh 19, Pa.

National Mine Service (Canada) Limited, Elliot Lake, Ontario

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⑦ DISTRIBUTING DIVISIONS



MINING MUCKER

4000 POUND CARRY CAPACITY

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"The Mining Industries Most Maneuverable Underground Scoop"

DEALERSHIPS
AVAILABLE

always in the market for

ORES SCRAP RESIDUES

gold—silver—copper
zinc and lead ores, sweeps,
mattes, and bullion
copper and brass scrap
copper-bearing material
zinc drosses and skimmings
lead scrap and residues
lead-covered cable
tin-bearing material
automobile radiators

custom smelters and refiners

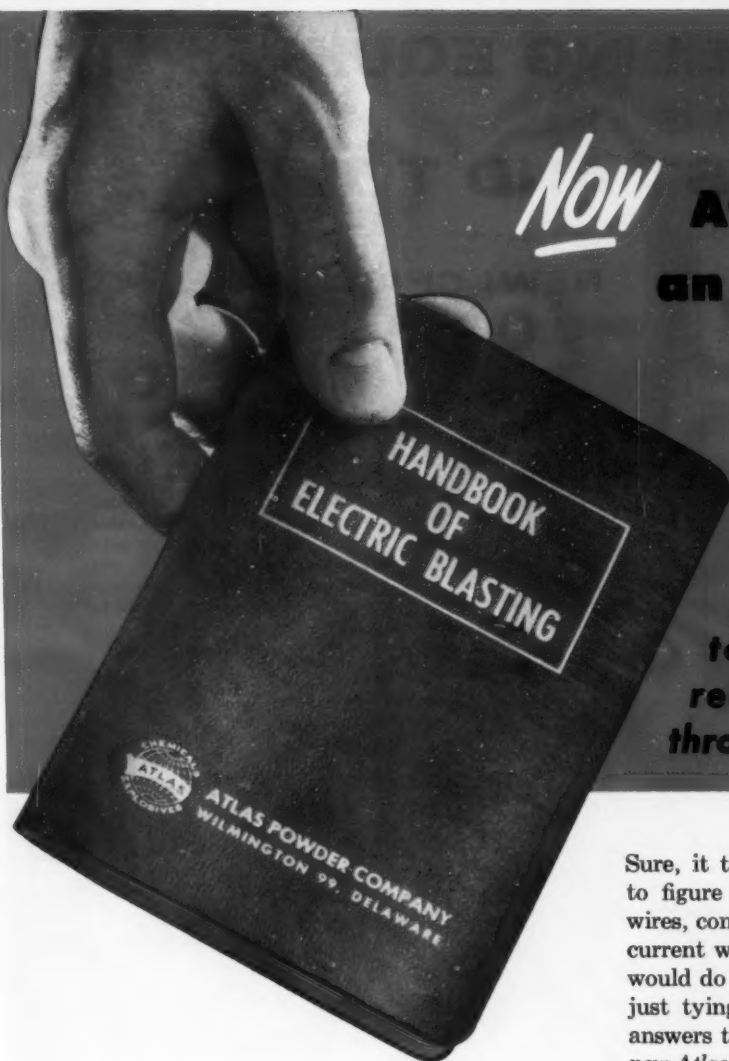
AMERICAN METAL CLIMAX, INC.
61 Broadway, New York 6, New York



Now

**Atlas publishes
an authoritative
manual
on electric
blasting**

**Describes techniques
to minimize cut-offs,
reduce noise, control
throw, improve breakage**



Ask your Atlas representative to show you the electric blasting cap match demonstration. See why Atlas E.B. caps lead the field in dependable performance.

Sure, it takes skill to blast electrically! You have to figure resistances of electric blasting caps, leg wires, connecting and leading wires . . . know what current will fire how many caps . . . what circuits would do the job best. There's a lot more to it than just tying square knots! But when you have the answers to these and other factors, *all covered in the new Atlas Handbook*, look at the advantages you get:

- Initiation at the point that puts the full explosive force to work
- Dependable split-second timing in each charge before the rock begins to move
- Better control of throw • Minimum noise and vibration

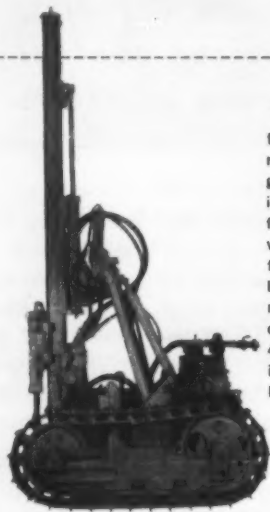
The pay-off is in more complete breakage, quicker, safer digging, reduced crushing and maintenance costs, better public relations. Write now for your copy of the new Atlas "*Handbook of Electric Blasting*." Discuss the methods it describes with your Atlas representative. He has a whole kit full of ways to help lower your blasting costs and get better breakage.

EXPLOSIVES
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ATLAS
POWDER COMPANY
WILMINGTON 99, DELAWARE
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pick **CP DRILLING EQUIPMENT** when the going is... **ROUGHEST AND TOUGHEST**

CP drilling equipment *really goes to work* when the going is toughest. It has the stamina to keep footage records high, and maintenance costs low.

There is a complete line of CP drilling equipment for metal mining. Hydraulic Boom Arms, Shaft Jumbos, Stopers, Drifters, Airlegs, Portable and Stationary Air Compressors, Diesel Engines, Portable Pneumatic and Electric Tools.



G-800 TRACDRIL

tows its own compressor over rough terrain, and up steep grades. Hydraulic positioning of drill carriage simplifies raising or lowering as well as inclining left, right, forward or back to obtain best drilling angles, easiest movement. Equipped with deep hole drills of 4" or 4½" cylinder bore, and having maximum capacity of 3" holes to 75 feet.



CP 3-CONE AIR-BLAST BITS

are built for rotary deep hole drilling. Jet nozzles provide high-velocity hole cleaning action. There's a bit type designed for all formations ranging from very soft to extremely hard. Bit sizes from 5½" to 12¼".

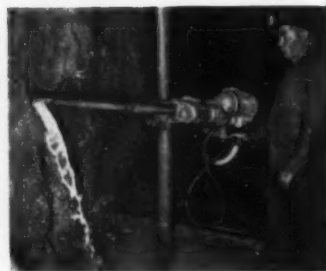
NEW! CP-69 SINKER



available with integral or attachable Airlegs. This 55-pound class sinker is well-balanced with good hitting power. New type beaver tail retainer eliminates retainer springs—improves steel retention, reduces steel breakage. Can be rotated 180° for lateral and overhead or down-hole work. New design of fronthead features inexpensive, renewable chuck bushing. Has all-purpose backhead for blower-dry, wet, and automatic air-water operations. Four other models from 30-pound to 55-pound class are available.

CP-65 AIR-DRIVEN DIAMOND DRILL

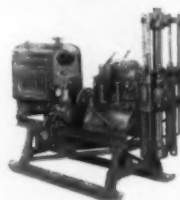
is ideal for underground blast holes and coring. 50% more motor power gives high drilling speed and greater capacity under all conditions. Reversibility speeds up screwing and unscrewing of rod joints . . . moves drill quickly into drilling position. Complete drill with built-in swivel head measures only 42½" . . . weighs just 200 pounds, capacity to 600 feet.



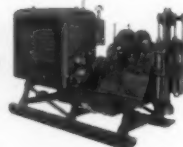
CP-8HD and 15HD DIAMOND DRILLS

are designed to provide the greatest degree of versatility in surface exploration. Mounted on skids, they can be readily moved from hole to hole under their own power. Bolted framing permits fast knock-downs for transportation to remote sites.

Available without skids for truck or jeep mounting. Air, gasoline and diesel drives. Capacities with EW-EX fittings: Model 8HD—1250 feet; Model 15HD—2250 feet.



Model 8HD



Model 15HD



Chicago Pneumatic 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AIR-BLAST BITS

3

New International® Earthmovers

new CAPACITIES
(24 yd. scrapers, 27 yd. wagon)

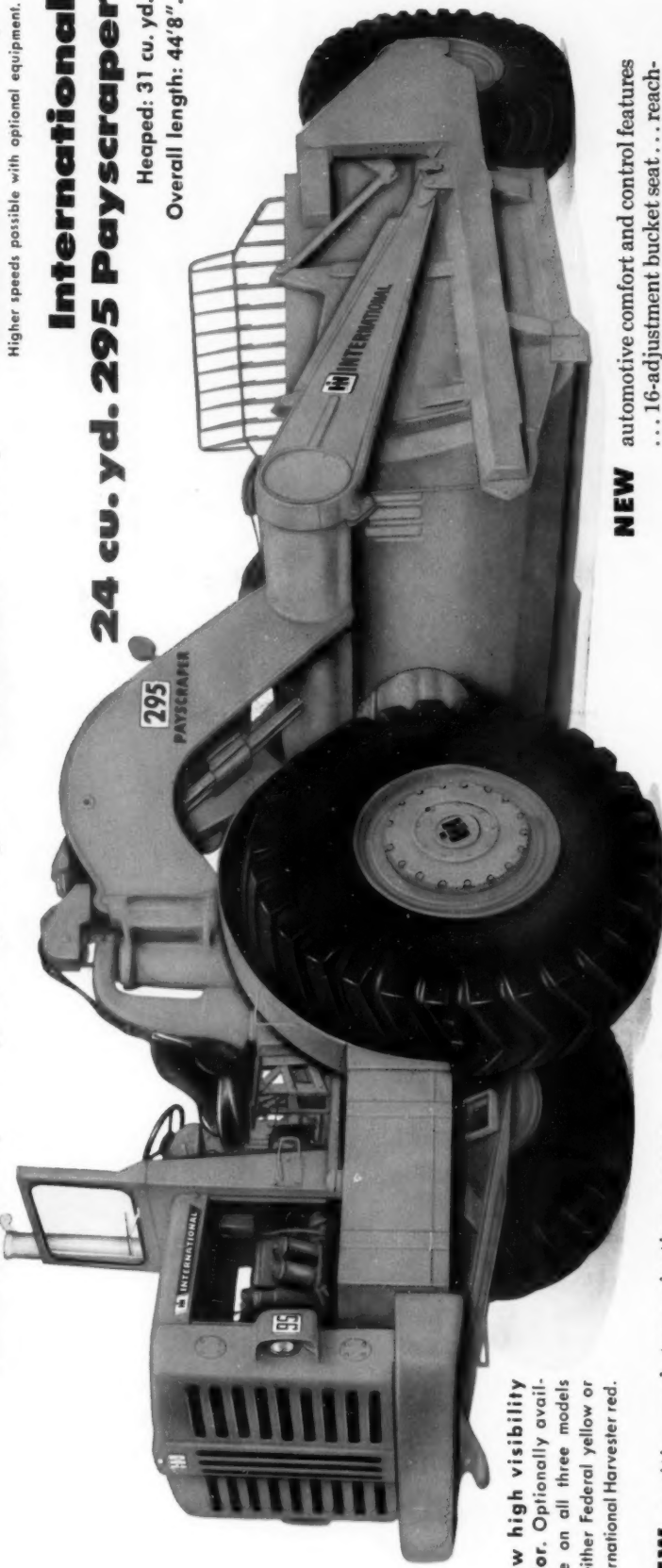
new POWER
(375 hp)

new SPEEDS
(to 29.1 mph)

Higher speeds possible with optional equipment.

International
24 cu. yd. 295 Payscraper

Heaped: 31 cu. yd.
Overall length: 44'8".



New high visibility color. Optionally available on all three models in either Federal yellow or International Harvester red.

NEW positive push-type ejection assures quick clean dumping of all materials.

NEW advanced lift frame construction with A-frame-type gooseneck that: 1) increases visibility; 2) distributes weight evenly along cross tube; and 3) protects sheaves of bowl lift system.

NEW full 90° turns with power steering.

NEW 375 hp DT-817 turbocharged 6-cylinder diesel engine. See page 4.

NEW cycle-shortening haul speeds to 26.2 mph plus unmatched maneuverability.

NEW exclusive tapered bowl. See next pages.

NEW high 98" apron opening. See pages 2-3.

NEW automotive comfort and control features ... 16-adjustment bucket seat ... reach-easy controls ... unobstructed vision ... air brakes ... flush deck.

NEW Model 280 cable control unit ... fingertip control ... fast acting ... high capacity ... simple adjustments ... less maintenance.

See 3-axle models on inside pages...

27 cu. yd. International[®] 495 Paywagon[®]

Heaped: 40.5 cu. yd.
Payload: 40.5 tons.
Overall length: 50'4½"



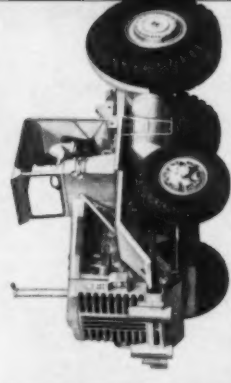
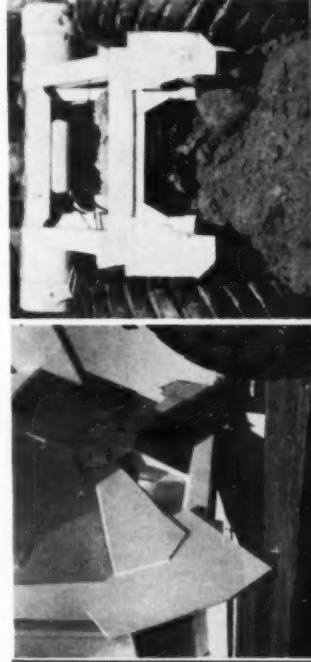
Here in the 27 cu. yd. International 495 Paywagon is everything that's new and productively *different* in bottom dump design. New 375 hp engine for greater power *per struck yard than any comparable rig*. New higher side and rear end clearance to roll away from any dumped load. New power-opened clamshell doors for positive controlled dumping. New wiper plates put 100% of each load on the fill. New automotive comfort and control features *that* let the operator produce more with less effort. New full 90° turning in either direction. New low design for haul road stability.

New exclusive power-opened clamshell doors afford positive controlled dumping. Operator spot dumps entire load or windrows material in lifts from a few inches on up. Wiper plates shave all material from doors as they raise. Doors gravity close, eliminating complicated mechanism.

Unmatched 60" rear end dumping clearance lets rig pull fast from fill with no dangling doors dragging on dumped material. Open rear frame lets loader spillage fall through — prevents buildup of "free loading" material.

375 HP 495 prime mover gives both 495 Paywagon and 495 Poyscraper more hp per struck yard with less gross weight per hp than any similar sized earth mover. Speeds to 29.1 mph. 10'8¼" wheel base. Full 180° non-stop turns can be made within 39'11¾".

NEW
high speeds
big capacities



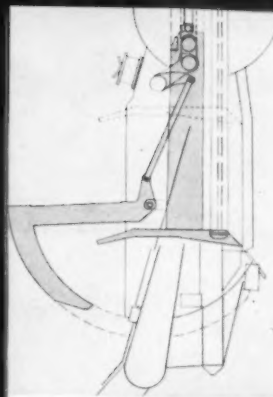
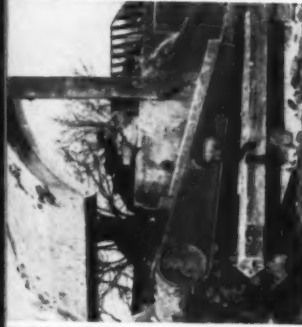
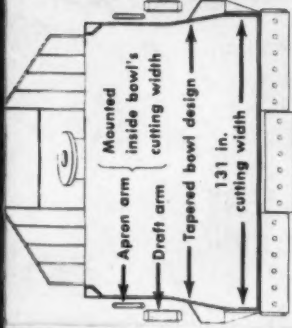
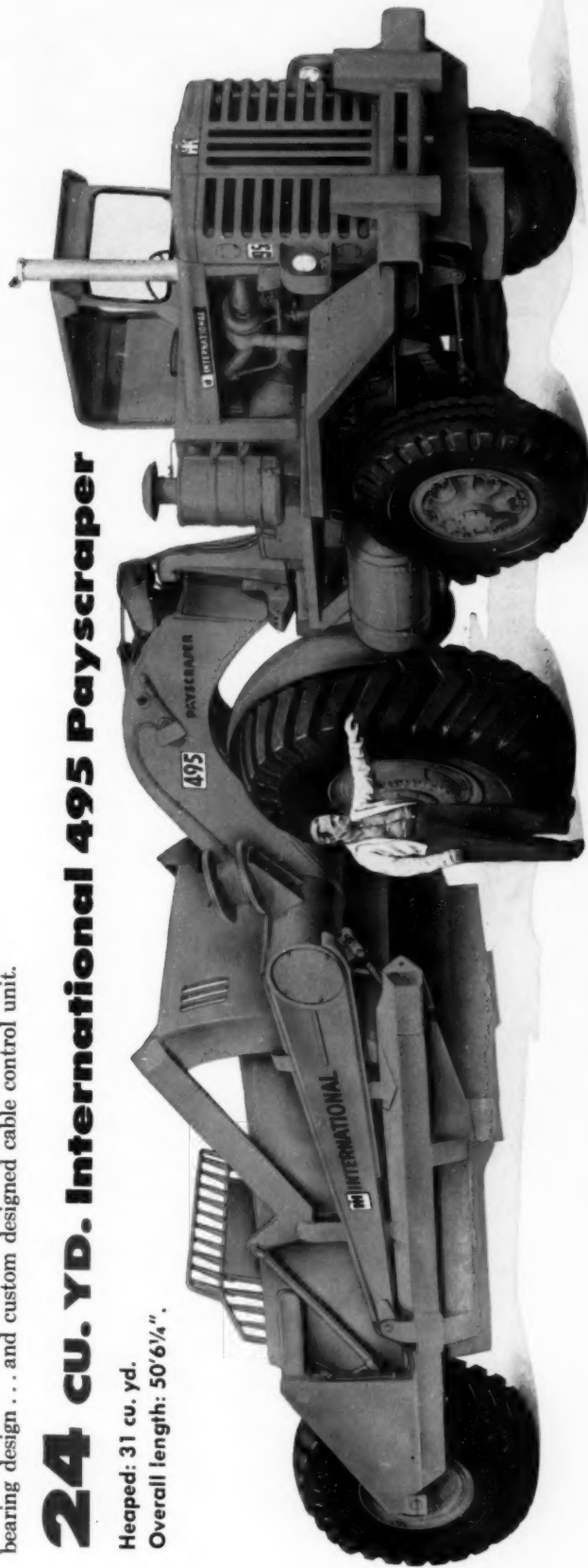
fast dumping unmatched control

This new International 495 Payscraper boils a heaped load into a 24 cu. yd. bowl in less time than any other three-axle scraper in its class and hauls it at speeds up to 29.1 mph. The trailing unit, common to the 295 Payscraper, offers this unmatched combination of features that cut dirt costs: big 131-in. cutting width... tapered bowl permits efficient ejection of all materials with equal ease... positive forced ejection... improved lift frame construction... full 90° turns... more hp per struck yard than all competitive units... wheels and bowl leveling adjustment... advanced sheave bearing design... and custom designed cable control unit.

24 cu. yd. International 495 Payscraper

Heaped: 31 cu. yd.

Overall length: 50'6 1/4".



Exclusive tapered bowl design: 1) permits scraper and pusher to work inside cut for best traction, less wear on tires, and tracks; 2) causes dirt to boil toward center, reducing side spillage; 3) extra wide bowl bottom provides wider spread, speeds dirt breakaway and lets scraper work cut's against banks.

Positive forced ejection dumps all materials — even wet or frozen clay and gumbo — cleanly and quickly. Six large ball bearing mounted rollers center and guide ejector gate, have 240-hour lube intervals.

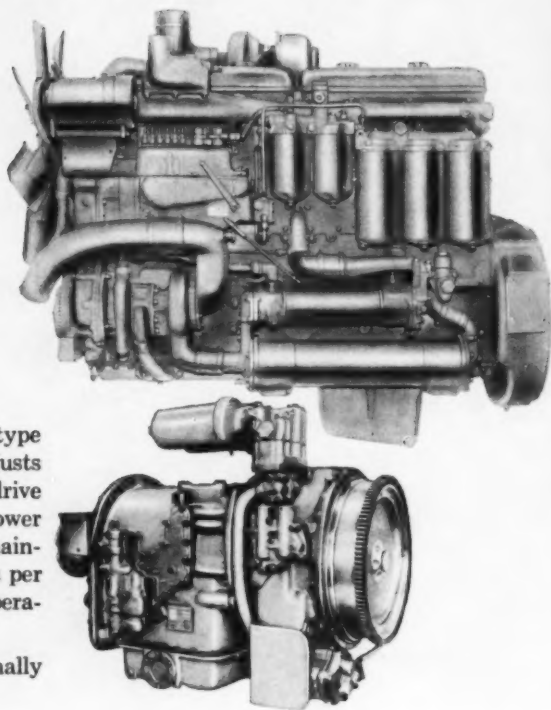
Gaping 98" apron opening plus no bowl cross member permits sure ejection of all materials. Apron opened by exclusive, rear-controlled mechanical linkage. Apron is synchronized with ejector for positive controlled spreading.

New Turbocharged International DT-817 powers all three giant earthmovers

- Develops 375 hp @ 2100 rpm
- Direct push-button, 24-volt starting
- Positive valve rotators — increase valve life
- Aluminum alloy pistons for fast heat dissipation
- Wet sleeve construction provides additional cooling
- Fully counterbalanced crankshaft for smooth engine performance
- Dual intake and exhaust valves for peak engine efficiency
- Twin plunger injection pump precision meters fuel
- Hang down type replaceable filters for maximum fuel and oil filtering efficiency
- Tri-metal crankshaft bearings for long trouble-free service

Both prime movers are available with 4-speed, planetary type torque converter power shift transmission. It automatically adjusts output torque and speed to fit load requirements. Torqmatic drive makes more power available over the entire range; applies power smoothly and continuously, resulting in less wheel slippage; maintains high tractive effort; and cuts the number of gear shifts per cycle, letting operator concentrate on loading and spreading operations.

A constant mesh 9-speed manual shift transmission is optionally available on both prime movers.



See your International Construction Equipment Distributor for complete information on these NEW International Earthmovers

International®



Construction Equipment

International Harvester Co. • 180 N. Michigan Ave., • Chicago 1, Ill.

A COMPLETE POWER PACKAGE; Crawler and Wheeler Tractors . . . Self-Propelled Scrapers and Bottom Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.



LOADING ROUND with new, small-diameter Hi-Cap.

WELL-BROKEN ORE resulting from blast with new, economical DuPont explosive.



Du Pont HI-CAP® goes underground... in small diameter and 3 new grades

Now you can realize the substantial savings of Du Pont HI-CAP® in your underground work.

Formerly available only in larger diameters, HI-CAP was so well received that we have developed 3 new grades in small diameters (2" and less).

Low-cost, versatile • The versatility of the complete line of this low-priced, quality explosive now of-

fers substantial savings by its use in all types of shooting under all but the most severe conditions.

Field reports: high quality • Shot reports show that you sacrifice nothing in quality to get the economy of HI-CAP. It gives excellent fragmentation and good fumes. The denser grades have shown good water resistance.

Available now • Your Du Pont Sales Representative will be glad to arrange a trial or give you more information.

Or you can write to DuPont, Explosives Department, Wilmington 98, Delaware.

GRADE	STICK COUNT*	WATER RESISTANCE
HI-CAP 1	120	Good
HI-CAP 2	135	Fair
HI-CAP 3	150	None

*1 1/4" x 8" cartridges per 50 lbs.



EXPLOSIVES

BETTER THINGS FOR BETTER LIVING

...THROUGH CHEMISTRY

The Image of CF&I serves the *with* **QUALITY**



The Image of CF&I—a giant steelman—reflects the years of experience gained in developing and improving hundreds of CF&I steel products for many industries.

Typical of the wide range and top quality of all our products is CF&I's line of steel products for the mining industry. CF&I has been serving the needs of the mining industry since 1882. CF&I Mining Products are fabricated from quality steels produced in our own mills . . . and every product is tested, controlled and inspected during all steps of manufacture so that the industry's highest standards are met or exceeded. Performance has been thoroughly field-tested in our own mining operations as well as in those of our many customers.



CF&I grinding balls

Available in diameters from $\frac{3}{4}$ " to 5". Made from high-carbon steel with the ideal hardness-toughness balance to assure optimum grinding ability and wearability under the most severe conditions involving abrasion and impact.



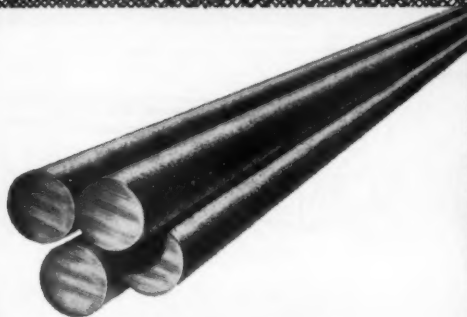
CF&I rock bolts and Realock metallic fabric

CF&I expansion shell type rock bolts with Pattin expansion shells are available in $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ " bolt sizes, in lengths from 24" to 96". Complete line of 1" slot and wedge type bolts also available. Used in conjunction with Realock metallic fabric, CF&I Rock Bolts reduce need for timbering and provide safe, economical, permanent support.

**Complete information on each of these products
is contained in CF&I's catalogs. Ask your
CF&I representative for them today.**

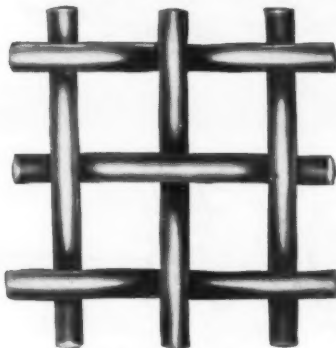
mining industry

STEEL PRODUCTS



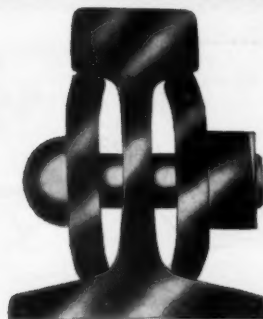
CF&I grinding rods

Available from 1½" to 4" diameters in sizes of ½" increments. Hot-rolled, machine-straightened, square-cut ends, made from special analysis steel to insure hardness for resistance to abrasion and bending; toughness to eliminate any premature breaking.



CF&I screens

Available in a wide variety of meshes, metals and weaves to satisfy every screening need. Made from the toughest steels and alloys for processing, cleaning, grading, filtering or screening applications, where resistance to corrosion, vibration, abrasion, fatigue or heat is needed.



CF&I mine rail and fastenings

Available in the range from 12 to 45 pounds. CF&I Mine Rail meets all A.R.A. specifications. Fastenings include: splice bars, angle bars, spikes, track bolts and nuts (both square and hexagonal).



CF&I-Wickwire wire rope

Available in all sizes, types, constructions and grades—including Double Gray extra-improved plow steel for applications where extra high strength is needed. CF&I-Wickwire Double Gray Wire Rope, made with an independent wire rope core, has a 15% higher breaking strength than the catalog breaking strength of improved plow steel wire rope with independent wire rope core.

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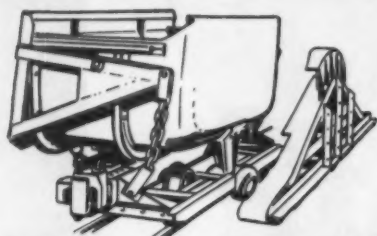
FOR YOUR PRODUCTION

Our shops are known to mining men throughout the world for custom building of mine cars and other haulage equipment. Here are some of the standard and custom designed items made by Card. For complete information, write or phone.

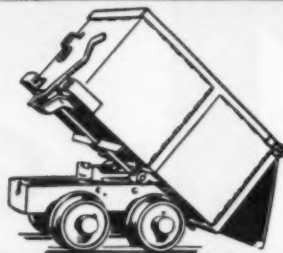
Frequently modification of a standard Card

car will serve to meet every specification of special haulage at very little more than the cost of a standard car. Our engineers can show you how to standardize your mine haulage with cars that are custom built for you alone. Many mine operators find they cannot afford even to make car

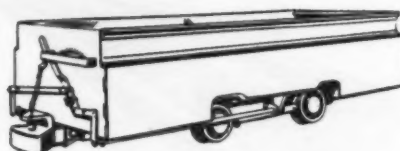
Cranby Car with Dump Block



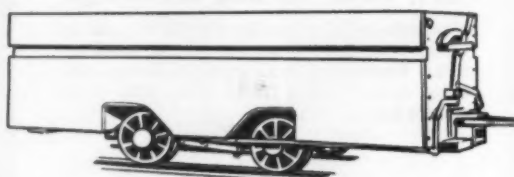
End Dump Turntable Type E



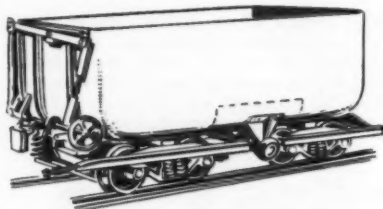
All-steel Rotary Dump Car



All-steel Rotary Dump Car



Large Capacity Cranby Car with Mechanical Brakes

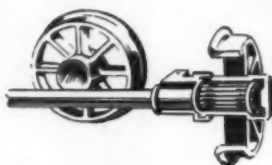


Coal Mine Cars
Ore and Industrial Cars
Mine Car Wheels & Trucks
Sheaves—Rope, Knuckle, Curve
Track Rope Rollers, Slope
Rollers
Carrying Sheaves, Swivels,
Hitchings
Loading Booms, Landing Chairs
Automatic and Plain Cages
Skips and Dumps
Revolving Screens
Perforated Screen Plates
Truckloaders
Track Turnouts
Frogs, Crossovers, Guard Rails
Split Switches
Switch Stands
Track Turntables
Rail Sections and Parts

Bicycle Spoke Sheaves



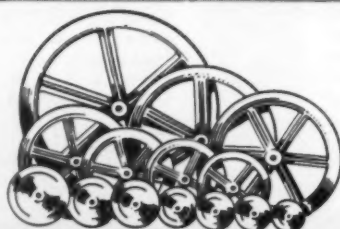
Card Roller Bearing Truck



Card Timken Bearing Truck

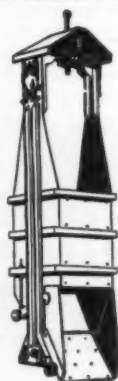


Standard Rope Sheaves, Heavy Pattern

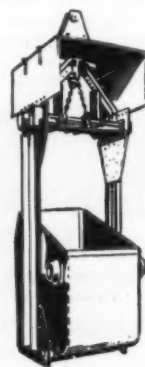


Card Automatic Skips

BOTTOM
DUMP
TYPE



KIMBERLEY
TYPE



Be your production large or small, Card can fit your needs—economically. Our engineers are available for consultation on your haulage problem. No obligation.

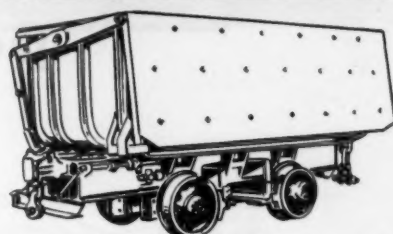
HAULAGE **Pick a winning Card!**

bodies and repair parts...Card prices are lower even after freight costs are added.

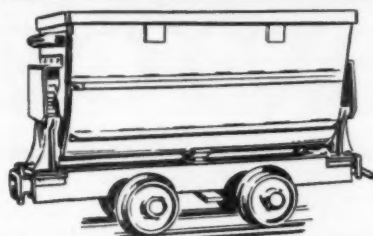
Note the partial list of customers below. Some are now replacing original orders after 10-20 years...with Cards, of course.



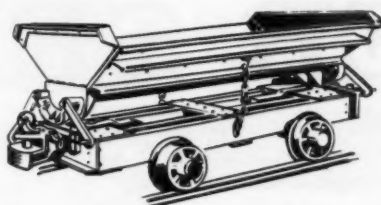
A Popular Granby-Type Car



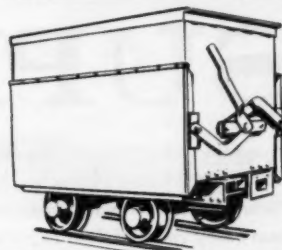
Rocker Dump Car



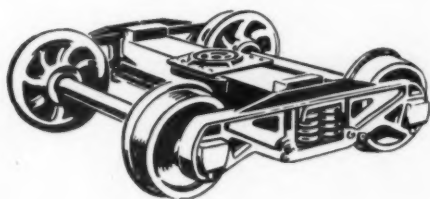
Rocker Dump Car, extra low



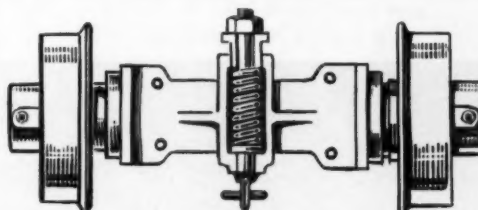
Gable Bottom Type Car



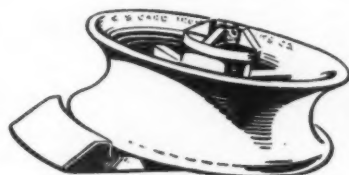
Spring Mounted Bolster Truck



Patented Spring Drawbar Truck



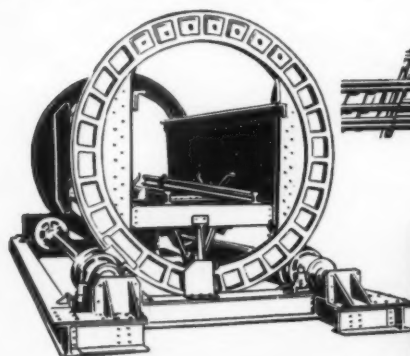
Card Curve Sheave



Roller Bearing Track Rope Roller



Card Power Driven Rotary Dump



Example of Card Track Equipment



CLIMAX MOLYBDENUM
INTERNATIONAL MINERALS
PHELPS DODGE
KENNECOTT COPPER
U. S. VANADIUM
U. S. POTASH
VERMONT COPPER
HOWE SOUND
CALERA MINING
HOMESTAKE
TELLURIDE MINES
IDARADO
CANANEA CONSOLIDATED
COPPER CO.
ANACONDA
VICTOR CHEMICAL WORKS
CLEVELAND CLIFFS IRON
POTASH CO. OF AMERICA
CONSOLIDATED MINING &
SMELTING CO. OF CANADA
AMERICAN SMELT. & REF.
UNITED STATES SMELT. REF.
& MINING
UNION PACIFIC COAL
GENEVA COAL CO.
COLO. FUEL & IRON CORP.
INDEPENDENT COAL & COKE
COLO. & UTAH COAL
TUNGSTEN MINING
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C.S. Card Iron Works Co.

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**toughest
portable
power
cables
made!**

SUPER SERVICE

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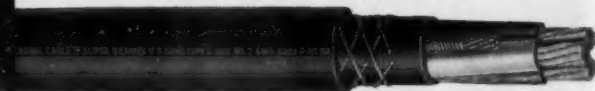




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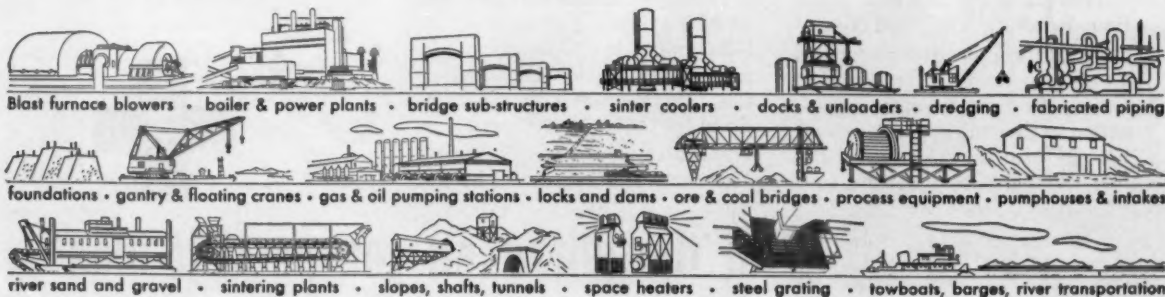
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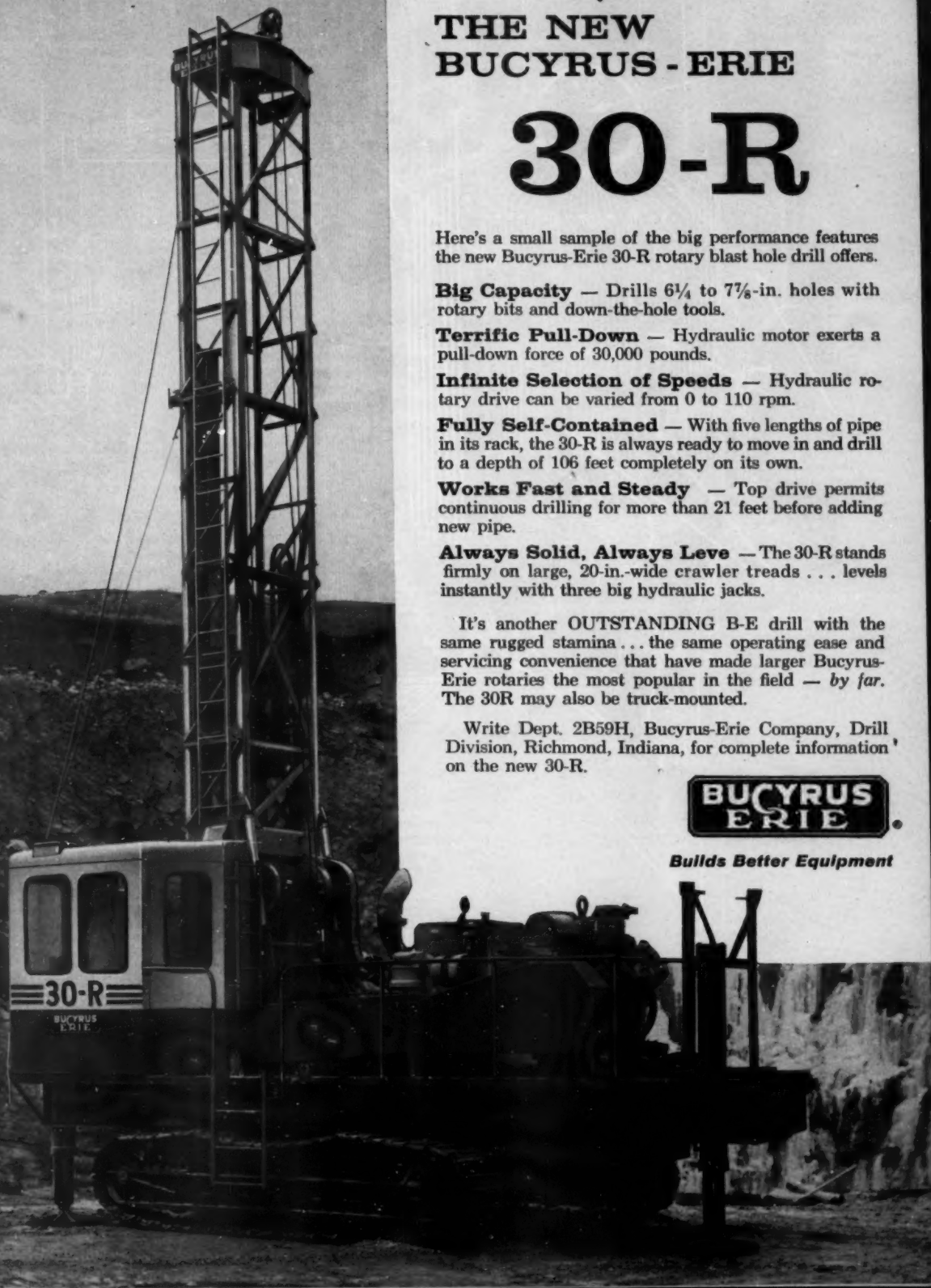
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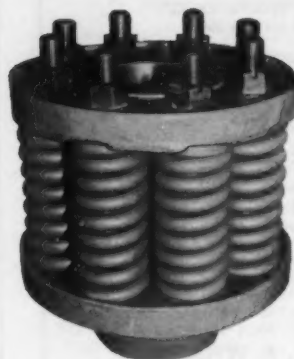
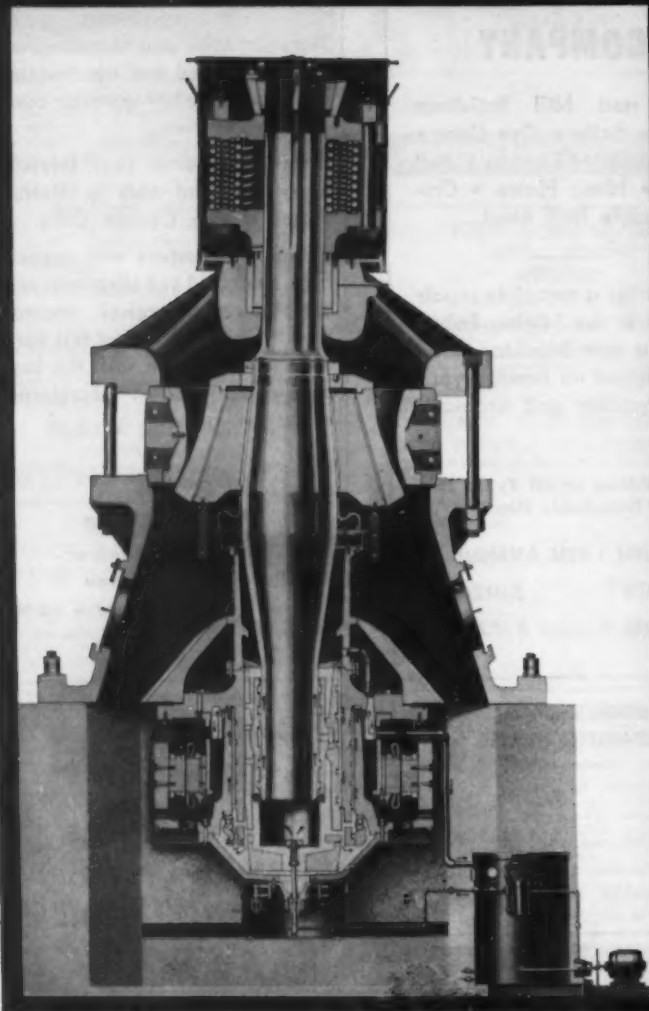
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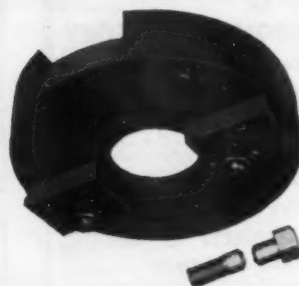
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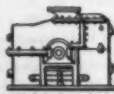
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1959 Catalog Index of Equipment and Manufacturers

The CATALOG INDEX is comprised of two sections:

SECTION I is an alphabetical listing of the specialized products and equipment used by the **MINE-MILL-SMELTER** industry. All principal manufacturers of these products and equipment are listed for your convenience.

SECTION II is an alphabetical list of all principal manufacturers **AND THEIR ADDRESSES**.

The names of manufacturers who are represented in

this issue by catalogs or advertisements are printed in **BOLDFACE** type in Sections I and II. The page numbers of their catalogs or advertisements are also given in Section II.

Every effort has been made to make your **MINING WORLD-WORLD MINING CATALOG ISSUE**, Development and Directory Number as complete and accurate as possible. **MINING WORLD**, however, cannot be responsible for changes in names, addresses, and other discrepancies.

SECTION I Equipment Index

SECTION I contains an alphabetical list of product and equipment names. Wherever feasible, equipment has been indexed under headings representing the nomenclature preferred by the industry; or in many cases under the principal proper noun. For example,

"Flotation Machines" are indexed as such rather than under the all-encompassing heading "Machines." Rock Drills, however, have been most logically listed as "Drills, Rock." European terms have been retained where applicable and understandable.

ACETYLENE

See Welding Equipment, Supplies, and Services

ACID

See Reagents and Chemicals

ACTUATORS

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TRIAL DIV.
EXIDE INDUSTRIAL—SEE ELEC-
TRIC STORAGE BATTERY
CO., THE EXIDE INDUSTRI-
AL DIV.
Gould-National Batteries, Inc.
INTERNATIONAL B. F. GOOD-
RICH
Oldham & Son, Ltd.

BATTERY CHARGERS

See Chargers, Battery

BEARINGS

BALL

Dodge Mfg. Corp.
FRICTION FIGHTER—SEE LINK-
BELT CO.
General Motors Corp., New De-
parture Div.
LINK-BELT CO.
MRC—see Marlin-Rockwell, Inc.
Nice Ball Bearing Co.
SC & SCM—see Dodge Mfg. Co.
S K F Industries Inc.
SEALMASTER—SEE STEPHENS
ADAMSON MFG. CO.
STEPHENS-ADAMSON MFG. CO.

ROLLER

Dodge Mfg. Co.
Dodge-Timken—see Dodge Mfg. Co.
FRICTION FIGHTER—SEE LINK-
BELT CO.
LINK-BELT CO.
Marlin-Rockwell, Inc.
S K F Industries, Inc.
Shafer—see Chain Belt Co.
TIMKEN ROLLER BEARING CO.
Tyson Bearing Corp.

SLEEVE

AMERICAN BRAKE SHOE CO.
Ampeo Metal, Inc.

Ampeo Metal Bronze—see Ampeo
Metal, Inc.
Birckett, Hillings & Newton, Ltd.
Dodge Mfg. Corp.
Graphite Metallizing Corp.
LINK-BELT CO.
SKF Hellefors Jernverk
Sleeve—see Dodge Mfg. Co.
STEARNs-ROGER MFG. CO.
Tapered—see S K F Industries, Inc.

BELL SYSTEMS

See Communications

BELTS AND BELTING

See also Conveyor Equipment;
Fasteners, Belt; Safety Equip-
ment

CHAIN LINK AND METAL

AMERICAN BRAKE SHOE CO.
American Brake Shoe Co., Amer.
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
American Chain & Cable Co., Inc.
American Chain Div.
COLORADO FUEL & IRON
CORP., THE
ELECTRIC STEEL FOUNDRY CO.
ESCO—SEE ELECTRIC STEEL
FOUNDRY CO.
HEWITT-ROBINS, INC., ROBINS
CONVEYORS DIV.
Korb-Pettit Wire Fabric & Iron
Works, Inc.
LINK-BELT CO.
LXS—SEE LINK-BELT CO.
PROMAL—SEE LINK-BELT CO.
Rubber Improvement Ltd.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Thiele, August G.m.b.H.
U. S. Rubber Co.
U. S. STEEL EXPORT CO.
Yuba Manufacturing Div.
WISCO—SEE COLORADO FUEL
& IRON CORP.

LEATHER BELTING

Carlyle Rubber Co., Inc.
Dodge Mfg. Corp.
Gates Rubber Co.
GOODALL RUBBER CO.
Houghton & Co., E. F.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
Tannate—see Rhoads & Son, J. E.
Vim-Tred—see Houghton & Co.,
E. F.
Williams & Sons, I. B.

RUBBER BELTING

Flat Belts

AJAX—SEE HEWITT-ROBINS,
INC.
American Rubber Mfg. Co.
BARBER-GREENE COMPANY
Bear—see American Rubber Mfg.
Co.
Boston Woven Hose & Rubber Co.
Carlyle Rubber Co., Inc.
Challenger—see Lee Rubber & Tire
Corp., Republic Rubber Div.
CONSERVO—SEE HEWITT-ROB-
INS, INC.
Crackerjack—see American Rubber
Mfg. Co.
Gates Rubber Co.
GOODALL RUBBER CO.
GOODRICH CO. B. F. THE INDUS-
TRIAL PROD. DIV.
Goodyear Tire & Rubber Co.
HEWITT-ROBINS, INC.
INTERNATIONAL B. F. GOOD-
RICH
Invader—see Lee Rubber & Tire
Corp., Republic Rubber Div.
Korb-Pettit-Wire Fabrics & Iron
Wks., Inc.
Lee Rubber & Tire Corp., Republic
Rubber Div.
MALTESE CROSS—SEE HEWITT-
ROBINS, INC.
Quaker Pioneer Rubber Mills
QUAKER RUBBER CO.
Raybestos-Manhattan, Inc.
Republic Rubber Div., Lee Rubber
& Tire Corp.
Rubber Improvement Ltd., Well-
borough, England
Thiele, August G.m.b.H.
THERMOID CO.
United States Rubber Co.
United States Rubber Int'l.
Williams & Sons, I. B.
Yosemite—see American Rubber
Mfg. Co.

RUBBER BELTING

V-Belts

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Boston Woven Hose & Rubber Co.
Carlyle Rubber Co., Inc.
Champion—see Lee Rubber & Tire
Corp., Republic Rubber Div.
Dayton Rubber Co.
Dodge Manufacturing Corp.
Gates Rubber Co.
GOODALL RUBBER CO.
Goodrich Co., B. F. The Industrial
Products Div.
Goodyear Tire & Rubber Co.
HEWITT-ROBINS, INC.
INTERNATIONAL B. F. GOOD-
RICH
Lee Rubber & Tire Corp., Republic
Rubber Div.
LINK-BELT CO.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
Quaker Pioneer Rubber Mills
QUAKER RUBBER CO.
Raybestos-Manhattan, Inc.
Republic Rubber Div., Lee Rubber
& Tire Corp.
Sealed-Lite—see Dodge Mfg. Co.
TEXROPE—SEE ALLIS-CHAL-
MERS MFG. CO., INDUS-
TRIES GROUP
THERMOID CO.
United States Rubber Co.
United States Rubber Int'l.
Williams & Sons, I. B.
Worthington Corp.

BINS, CHUTES, HOPPERS & ACCESSORIES

See also Feeders

BINS AND CHUTES

ALLISON STEEL MFG. CO.
American Brake Shoe Co., Amer.
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
BARBER-GREENE CO.
Bethlehem Steel Co.
Columbian Steel Tank Co.
Com-Bin Feeder—see Palva Corp.
Davison & Co. (Hexham) Ltd.
Fraser & Chalmers
General Electric Co., Ltd.
HACK ENGINEERING CO.
HEAD WRIGHTSON, STOCKTON
FOGGE LTD.
HEWITT-ROBINS, INC.
Hirsch Bros. Machinery Co.
Hockensmith Corp., The
Humboldt, Klockner-Humboldt-
Deuts., A. G.
INTERNATIONAL B. F. GOOD-
RICH CORP.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Klockner-Humboldt-Deuts. A. G.
Koshing Co., Johnson Co., C. S. &
subsid.
LINK-BELT CO.
Lippmann Engineering Works
Mayo Tunnel & Mine Equip.
McNally Pittsburgh Mfg. Co.
MINERS FOUNDRY & MFG. CO.
NATIONAL IRON CO.
Pegson Ltd.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor &
Co., Inc.
Pioneer Engineering Works, Inc.
Pollock Co., The Wm. B.
Richardson Scale Co.
Roberts & Schaefer Co.
Rogers Iron Works
Sanford-Day Iron Works, Inc.
SANTA FE TANK DIV., FLUOR
PRODS. CO.
Smith Engineering Works
STEARNs-ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
United States Steel Co., Amer.
Bridge Div.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Wamco—see Washington Machin-
ery Co.
Washington Machinery Co.
Watt Car & Wheel Co., The
Yuba Consolidated Industries, Yuba
Mining Div.

GATES, LIPS, ETC.

ALLISON STEEL MFG. CO.
American Brake Shoe Co., Amer.
Manganese Steel Div.

AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Fraser & Chalmers Eng. Works
General Elec. Co. of England, Ltd.
HACK ENGINEERING CO.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-
Deuts., A. G.
Klockner-Humboldt-Deuts. A. G.
Koshing Co., Johnson Co., C. S. &
subsid.
LINK-BELT CO.
Lippmann Engineering Works
McNally Pittsburgh Mfg. Co.
MINERS FOUNDRY & MFG. CO.
NATIONAL IRON CO.
Pegson Ltd.
Pioneer Engineering Div., Poor &
Co., Inc.
Roberts & Schaefer Co.
Sanford-Day Iron Works, Inc.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
Universal Dredge Mfg. Co.
Wamco—see Washington Machinery
Co.
Washington Machinery Co.

INDICATORS

Bin-Dicator Co., The
Convalr, Inc.
DENVER EQUIPMENT CO.
Fraser & Chalmers Eng. Works
General Electrical Co. of England,
Ltd.
HEWITT-ROBINS, INC.
Hirsch Bros. Machy. Co.
Jeffrey Mfg. Co., The
Koshing Co., Johnson Co., C. S. &
subsid.
McNally Pittsburgh Mfg. Co.
ROBIN TRONIC—SEE HEWITT-
ROBINS, INC.
STEPHENS-ADAMSON MFG. CO.
TELLEVAL—SEE STEPHENS-
ADAMSON MFG. CO.
TELLURIDE IRON WKS.

VIBRATORS

BARBER-GREENE CO.
Carrier Conveyor Corp.
Cleveland Vibrator Co., The
Consolidated Pneumatic Tool Co.,
Ltd.
DENVER EQUIPMENT CO.
Eries Mfg. Co.
Fraser & Chalmers Eng. Works
GARDNER-DENVER CO.
General Electric Co. Ltd., The
HEWITT-ROBINS, INC.
KENNEDY-VAN SAUN MFG. CO.
LINK-BELT CO.
Lippmann Engineering Works
Rotary Silent—see Martin Engi-
neering Co.
Scott's Concentrators
Sherwen—see General Elec. Co. of
England, Ltd.
STEPHENS-ADAMSON MFG. CO.
SYNTRON CO.
TY-SPEED—SEE TYLER CO.,
THE W. S.
TYLER CO., THE W. S.
Universal Engineering Corp.

BITS

See also Steel; Diamond Bit Re-
setting Service; Tungsten Car-
bide Products

AUGER BITS

ACKER DRILL CO., INC.
AMERICAN BRAKE SHOE CO.
Bohler Bros. & Co. Ltd.
Carbology—see General Electric Co.,
Metallurgical Products Dept.
Cardox Corp.
Central Mine Equipment Co.
Coal Master—see Central Mine
Equipment Co.
Coeur d'Alene Hardware & Foundry
Co.
English Drilling Equipment Co. Ltd.
Failing Co., Geo. C.
Firth Sterling Inc.
Firthite—see Firth Sterling Inc.
GARDNER-DENVER CO.
General Electric Co., Metallurgic
Products Dept.
George Moss Pty. Ltd.
SKF Hellefors Jernverk
Kennametal Inc.
Kerfmaster—see Central Mine
Equipment Co.
Mobile Drilling Inc.
Pennsylvania Drilling Co.

Salem Tool Co.
Salsgitter Maschinen A. G.
Thor Power Tool Co.
Vascoloy-Ramet Corp.

CHURN BITS

BUCHYUS-ERIE CO.
General Electric Co., Carboly Dept.
Mill Iron Works, Inc.
Mobile Drilling, Inc.
SPANG & CO.
Westinghouse Air Brake Co., Le
Roi Div.

CUTTING MACHINE

Carboly—see General Electric Co.,
Metallurgical Products Dept.
Firth Sterling, Inc.
Firthite—see Firth Sterling, Inc.
Jeffrey Mfg. Co., The

DIAMOND BITS

ACKER DRILL CO., INC.
American Coldset Corp.
Ascolite—see Smit & Co., Inc.
BOYLES BROS. DRILLING CO.
Boyles Bros. Drilling Co., Ltd.,
(Canada)
Bronsolite—see Smit & Co., Inc.,
Anton
Champion Diamond Co.
CHRISTENSEN DIAMOND PROD-
UCTS CO.
Damco—see Drilling Accessory &
Mfg. Co., Inc.
DIAMOND TOOL RESEARCH CO.,
INC.
Drilling Accessory & Mfg. Co., Inc.
English Drilling Equipment Co.
Falling Co., Geo. C.
General Electric Co., Carboly Dept.
Hard Had—see Smit & Sons, Inc.,
J. K.
Havilek, J. L.
Hitchcock Mfg. Co., Leo
Hoffman—see Stanton & Co.
Hoffman Bros. Drilling Co.
Impregnate—see Smit & Co., Inc.,
Anton
JOY MANUFACTURING CO.
Koebel Diamond Tool Co.
Koebelite—see Koebel Diamond Tool
Co.
LONGYEAR CO., E. J.
Metal Carbides Corp.
Mobile Drilling Inc.
Nicotite—see Smit & Co., Inc.,
Anton
Pennsylvania Drilling Co.
Permaset—see Boyles Bros. Drilling
Co., Ltd.
ROSSET—SEE SPRAGUE & HEN-
WOOD, INC.
Shark Tooth—see American Coldset
Corp.
Smit & Co., Inc., Anton
Smit & Sons, Inc., J. K.
SPRAGUE & HENWOOD, INC.
STANCO MFGS. & SALES, INC.
Svenska Diamantbergrörningar AB.
TELLURIDE IRON WORKS CO.
Thor Power Tool Co.
TUFSET—SEE SPRAGUE & HEN-
WOOD, INC.
TRUCAST—SEE SPRAGUE &
HENWOOD, INC.
Trusco—see Wheel Trussing Tool Co.
L. M. Van Moppes & Sons
VAREL DIAMOND PRODUCTS
CO.
VAREL MANUFACTURING CO.
Wheel Trussing Tool Co.
Winter, Ernst & Son

PERCUSSION BITS

American Coldset Corp.
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
ATLAS COPCO, A. B., SWEDEN
Bohler Bros. & Co., Ltd.
BRUNNER & LAY, INC.
BUCHYUS-ERIE CO.
CARSET—SEE INGERSOLL-
RAND CO.
Cleveland Rock Drill Div., Westing-
house Air Brake Co.
DEMAG AKTIENGESellschaft
English Drilling Equipment Co.
Firth Sterling, Inc.
Firthite—see Firth Sterling, Inc.
GARDNER-DENVER CO.
General Electric Co., Carboly
Dept.
Harnet—see American Coldset Corp.
Hiltman Co., Inc., C. Kirk
Holman Bros. Ltd., (England)
Holman Brothers (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
Kennametal Inc.
LIDDICOAT—SEE WESTERN
ROCK BIT MFG. CO.
Manchester Bit Corp.

McCauley Industrial Corp.
Metal Carbides Corp.
Minerals Engineering Co., (Cela.)
Mobile Drilling Inc.
Powermite Drill & Tool Co.
Rip-Bits, Ltd.
ROK BITS—SEE BRUNNER &
LAY, INC.
SANDVIG COROMANT—SEE AT-
LAS COPCO PACIFIC, INC.
Thor Power Tool Co.
Throwaway Bit Corp.
TIMKEN—SEE TIMKEN ROLLER
BEARING CO.
TIMKEN ROLLER BEARING CO.
Tungstone—see Minerals Eng. Co.
Uddeholms Aktiebolag
Vascoloy—Ramet Corp.
WESTERN ROCK BIT MANU-
FACTURING CO.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roi Div.

ROTARY BITS

ACKER DRILL CO., INC.
Blue Demon—see Hawthorne, Inc.,
Herb J.
Central Mine Equipment Co.
CHICAGO PNEUMATIC TOOL CO.
Damco—see Drilling Accessory &
Mfg. Co., Inc.
Demo Tool Co.
Drilling Accessory & Mfg. Co., Inc.
English Drilling Equipment Co.
Falling Co., Geo.
Firth Sterling, Inc.
Firthite—see Firth Sterling, Inc.
GARDNER-DENVER CO.
General Electric Co., Metallurgical
Products Dept.
Hawthorne Inc., Herb J.
Hitchcock Mfg. Co., Leo
Hoffman Bros. Drilling Co.
Hughes Tool Co.
JOY MFG. CO.
KENNAMETAL INC.
Kerfmaster—see Central Mine
Equipment Co.
LONGYEAR CO., E. J.
Mobile Drilling, Inc.
OIL TOOL MFG. CO.
Powermite Drill & Tool Co., Se-
curity Engineering Div.
Sprague & Henwood, Inc.
STANCO MFG. & SALES, INC.
Stripmaster—see Central Mine
Equipment Co.
Thor Power Tool Co.
VAREL MFG. CO.
Vascoloy-Ramet Corp.
Westinghouse Air Brake Co., Le
Roi Div.
Winter Weiss Co., The

BLASTING SUPPLIES

BLASTING MACHINES

ATLAS POWDER CO.
BC-2 Blaster—see Electro-Technical
Labs.
Coeur d'Alene Hardware & Foundry
Co.
DU PONT DE NEMOURS & CO.,
E. I. EXPLOSIVES DIV.
Electro-Technical Labs.
HERCULES POWDER CO.
Olin Mathieson Chem. Corp., Ex-
plosives Div.
SHOT MASTER—SEE ATLAS
POWDER CO.
Sly Mfg. Co., W. W., The
Trojan Powder Co.

DETONATING FUSES

American Cyanamid Co., Organic
Chemicals Div.
ATLAS POWDER CO.
Canadian Safety Fuse Co., Ltd.
COAST MFG. & SUPPLY CO.
Coeur d'Alene Hardware & Foundry
Co.
DU PONT DE NEMOURS & CO.,
E. I. EXPLOSIVES DIV.
Ensign-Bickford Co., The
HERCULES POWDER CO.
National Fuse & Powder Co.

Olin Mathieson Chem. Corp., Ex-
plosives Div.
Primacord—see Canadian Safety
Fuse Co., Ltd.
Trico Fuse Mfg. Co.
Trojan Powder Co.
Walker Machinery Co.

ELECTRIC CAPS

AMERICAN CYANAMID CO., EX-
PLOSIVE DEPT.
ATLAS POWDER CO.
Coeur d'Alene Hardware & Foundry
Co.
DU PONT DE NEMOURS & CO.,
INC., E. I. EXPLOSIVES DIV.
HERCULES POWDER CO.
Olin Mathieson Chem. Corp., Ex-
plosives Div.
ROCKMASTER—SEE ATLAS
POWDER CO.
Spencer Chemical Company
Trojan Powder Co.
Walker Machinery Co.

EXPLOSIVES

Accomite—see American Cyanamid
Co., Organic Chem. Div.
AMERICAN CYANAMID CO.
Apache Powder Co.
ATLAS-GIANT—SEE ATLAS
POWDER CO.
ATLAS POWDER CO.
Coeur d'Alene Hardware & Foundry
Co.
DU PONT DE NEMOURS & CO.,
INC., E. I. EXPLOSIVES DIV.
HERCULES POWDER CO.
Illinois Powder Mfg. Co.
International Geophysics, Inc.
Multipulse—see International Geo-
physics, Inc.
Olin Mathieson Chem. Corp., Ex-
plosives Div.
Spencer Chemical Company
Trojan Powder Co.
Walker Machinery Co.

SAFETY FUSES

ATLAS POWDER CO.
Black Clover—see Canadian Safety
Fuse Co., Ltd.
Canadian Safety Fuse Co., Ltd.
COAST MFG. & SUPPLY CO.
Coeur d'Alene Hardware & Foundry
Co.
DU PONT DE NEMOURS & CO.,
E. I. EXPLOSIVES DIV.
Ensign-Bickford Co., The
HERCULES POWDER CO.
National Fuse & Powder Co.
Olin Mathieson Chem. Corp., Ex-
plosives Div.
Trojan Powder Co.
Walker Machinery Co.

ACCESSORIES—other than above

AMERICAN CYANAMID CO., EX-
PLOSIVE DEPT.
ATLAS POWDER CO.
Canadian Safety Fuse Co., Ltd.
COAST MFG. & SUPPLY CO.
Coeur d'Alene Hardware & Foundry
Co.
COLEMAN CABLE & WIRE CO.
DU PONT DE NEMOURS & CO.,
INC., E. I. EXPLOSIVES DIV.
Economy Fuse & Mfg. Co.
Ensign-Bickford Co.
HERCULES POWDER CO.
Mahogany Importing Co.
Mine Safety Appliances Co.
Minnesota Mining & Mfg. Co. Ir-
rington Varnish & Insulator
National Fuse & Powder Co.
National Mine Service Co.
Olin Mathieson Chem. Corp., Ex-
plosive Dept.
Primacord—see Ensign-Bickford Co.
Tamping Bag Co., The
Thermalite—see Canadian Safety
Fuse Co., Ltd.
Trico Fuse Mfg. Co.
Trojan Powder Co.
Walker Machinery Co.

BLOCKS & SHEAVES

See also Conveyor Equipment

All Casteel—see Vulcan Iron Works
(Pa.)
ALLIS-CHALMERS MFG. CO., IN-
DUSTRIES GROUP, EXPONT
DIV.
ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO.
American Hoist & Derrick Co.,
Crosby-Laughlin Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
CARD IRON WORKS CO., THE
C. S.
Crosby Load Rated—see Amer.
Hoist & Derrick
Demag Aktiengesellschaft
Dodge Manufacturing Corp.
DUROLITE—SEE SAUERMAN
BROS., INC.
Gripshoit, Inc.
HADFIELD LTD.
HEWITT-ROBINS, INC.
Hockensmith Corp., The
Jones Foundry & Machine Co.,
W. A.

JOY MANUFACTURING CO.
KEENEY CO., PAUL E. (ROPE-
MASTER)
LAKE SHORE INC.
MCLEAN & STONE CORP.
NAT'L MALLEABLE & STEEL
CASTINGS CO.
Nat'l Supply Co., The
Ohio Hoist & Mfg. Co.
PACIFIC—SEE ALLOY STEEL &
METALS CO.
Page Engr. Co.
Princeton Gripshoit Inc.
RIBLET TRAMWAY CO.
ROPE MASTER—SEE KEENEY
CO., PAUL E.
Sanford-Day Iron Works, Inc.
SAUERMAN BROS., INC.
SEKOOLUM CO.
Taper-Lock—see Dodge Mfg. Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Tool Steel Gear & Pinion Co., The
VULCAN IRON WKS. CO.,
(COLO.)
VULCAN IRON WORKS CO. (PA.)
Washington Iron Wks.
Worthington Corporation
Yuba Manufacturing Co.

BLOWERS

See Ventilation Equipment
and Blowers

BODIES

See Trucks and Trailers;
Mine Cars

BOLTS, ROCK

Bethlehem Pacific Coast Steel Corp.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
CF&I—SEE COLORADO FUEL &
IRON CORP., THE
COLORADO FUEL & IRON
CORP., THE
Commercial Shearing & Stamping
Co., The
Dowty Mining Equipment, Ltd.
Elreco Corp., The
Ohio Brass Co.
Oliver Iron & Steel Corp.
Republic Steel Corp.
SHEFFIELD STEEL DIV.,
ARMCO STEEL CORP.
TELLURIDE IRON WKS.
U. S. Steel Corp.—Tennessee Coal
& Iron Div.
UNITED STATES STEEL EXPORT
CO.
Youngstown Sheet & Tube Co., The

BOOM ASSEMBLIES

See Drills; Excavators and
Attachments

BORTZ

See Diamonds, Industrial

BRAKES

DRUMS & MECHANISMS

LININGS

See Friction Material

**Manufacturer's Complete Names and Ad-
dresses are listed in Section II, last pages
of this yellow section. Firms appearing in
boldface caps carry advertisements in
this issue.**

Buckets

BUCKETS

See also Hoisting Equipment
Tramways, Aerial; Dredges and
Dredge Buckets; Conveyor
Equipment

CLAMSHELL

AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
Blaw-Knox Co., Blaw-Knox Div.
ELECTRIC STEEL FOUNDRY CO.
ESCO — SEE ELECTRIC STEEL
FOUNDRY CO.
Halsey Mfg. Co., Gen.
HARNISCHFEGGER CORP.
Kochring Co.
Link Belt Speeder Corp.
McDowell Co., Inc.
Owen Bucket Co.
Williams — see McDowell Co., Inc.
Yuba Consolidated Indus., Yuba
Mining Div.

DRAGLINE

American Brake Shoe Co., Amer.
Manganese Steel Div.
AMSCO — SEE AMERICAN BRAKE
SHOE CO.
BUCYRUS-ERIE CO.
CRESCENT — SEE SAUERMAN
BROS., INC.
ELECTRIC STEEL FOUNDRY
ESCO — SEE ELECTRIC STEEL
FOUNDRY
HADFIELD LTD.
McDowell Co., Inc.
Page Engr. Co.
Petitbone Muliken Corp.
RED ARCH — SEE BUCYRUS-
ERIE CO.
SAUERMAN BROS., INC.
Taylor-Wharton Iron & Steel Co.
Williams — see McDowell Co., Inc.
Yuba Consolidated Indus., Yuba
Mining Div.

BRIDGE

AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
ELECTRIC STEEL FOUNDRY CO.
ESCO — SEE ELECTRIC STEEL
FOUNDRY CO.
HADFIELD LTD.
McDowell Co., Inc.
Williams — see McDowell Co., Inc.
Yuba Consolidated Indus., Mining
Div.

SHOVEL

American Brake Shoe Co., Amer.
Manganese Steel Div.
AMSCO — SEE AMERICAN BRAKE
SHOE CO.
BUCYRUS-ERIE CO.
ELECTRIC STEEL FOUNDRY
ESCO — SEE ELECTRIC STEEL
FOUNDRY
Libb Shovel Co.
Petitbone Muliken Corp.
Taylor-Wharton Iron & Steel Co.

TEETH

AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
ELECTRIC STEEL FOUNDRY CO.
ESCO — SEE ELECTRIC STEEL
FOUNDRY CO.
HADFIELD LTD.
McDowell Co., Inc.
NATIONAL IRON CO.
Williams — see McDowell Co., Inc.

BUILDINGS,

PREFABRICATED

ALLISON STEEL MFG. CO.
Aluminum Co. of America
Armo Drainage & Metal Products,
Inc.
Bethlehem Pacific Coast Steel Corp.
Bethlehem Steel Co.
Black, Sivalls & Bryson, Inc.
Blaw Knox Co., Blaw-Knox Div.
HARNISCHFEGGER CORP.
Butler Manufacturing Co.
Columbian Steel Tank Co.
Republie Steel Corp., Truscon Steel
Div.
Truscon — see Republie Steel Corp.
U. S. Steel Corp., American Bridge
Div.
UNITED STATES STEEL
EXPORT CO.

BULLDOZERS

See Tractors and Attachments

BURNERS, OIL, GAS

AND COAL

BABCOCK & WILCOX CO., THE
Coppus Engineering Corp.
DFC — SEE DENVER FIRE CLAY
CO., THE
DENVER FIRE CLAY CO., THE
GENERAL MOTORS OVERSEAS
OPERATIONS
Iron Fireman Mfg. Co.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Klockner-Humboldt-Deuts AG
MINE & SMELTER SUPPLY CO.
Surface Combustion Corp.

BUYERS OF ORES

AND CONCENTRATES

See "Possible Markets Ores,
Metals and Non-metals"
elsewhere in this edition

CABLE AND CONDUIT

See also Rope, Wire; Tramway,
Aerial

ELECTRICAL CABLE AND CONDUIT ACIC

Alphaduct Wire & Cable Co.
Aluminum Co. of America
ANACONDA WIRE AND CABLE
CO.
Ankocon — The Anconia Wire &
Cable Company
Bethlehem Pacific Coast Steel Corp.
British Insulate Callender Cables,
Ltd.
Buckeye — see Youngstown Sheet &
Tube Co.
Canada Wire & Cable Co., Ltd.
Carlson Prod. Corp.
Carol Cable Co.
Chase Brass & Copper Co.
Circle Wire & Cable Corp.
COLEMAN CABLE & WIRE CO.
Collins Insulated Wire Co.
Electricduct — see CMG Industries
Essex Wire Corp.
Flex-A-Power — see General Electric
Co.
GENERAL CABLE CORP.
General Electric Co.
General Electric Co., Wire & Cable
Dept.
General Electric Co. of England,
Ltd.
GRAYBAR ELECTRIC CO., INC.
Hazard — see Okonite Co.
INTERNATIONAL GENERAL
ELECTRIC CO.
Johns-Manville Sales Corp.
Johnson & Phillips Ltd.
JOY MFG. CO.
Kordust — see Johns-Manville Corp.
Lowell Insulated Wire Corp.
Mersey Cable Works
MINE & SMELTER SUPPLY CO.
THE MARCY MILL DIVISION
Minnesota Mining & Mfg. Co., Ir-
vington Varnish & Insulator
Division
National Supply Co., The
Okonite Company, Hazard Insulated
Wire Works
Paranite — see Essex Wire Corp.
Paranite Wire and Cable Div.
Phelps Dodge Copper Products
Corp.
ROEBLING'S SONS CORP., JOHN
A
Rome Cable Corp.
Rome 60 — see Rome Cable Corp.
Siemens & Halske A. G.
SIMPLEX WIRE & CABLE CO.
SPAN — SEE NATIONAL SUP-
PLY CO., THE
TIGER BRAND — SEE U. S. STEEL
EXPORT CO.
Transite — see Johns-Manville Sales
Corp.
United States Rubber Co.
U. S. Steel Corp., American Steel &
Wire Div.
UNITED STATES STEEL CORP.,
COLUMBIA GENEVA STEEL
DIV.
UNITED STATES STEEL EXPORT
CO.
Western Insulated Wire Co.
Youngstown Sheet & Tube Co., The

CABLEWAYS, EXCAVATING

See Excavators

CAGES

See Hoisting Equipment

CALCINERS

See Dryers and Kilns;
Pyrometallurgical Equipment

CAPS

See Blasting Supplies

CARBIDE PRODUCTS

See also Tungsten

Carbide Products

Adamas Carbide Corp.
Air Reduction Sales Co.
ATLAS COPCO AB
Firth Sterling, Inc.
Firthite — see Firth Sterling, Inc.
Industrial Air Products Co.
Monsanto Chemical Co.
National Carbide Co.
National Cylinder Gas Co.
Union Carbide & Carbon Corp.—
Linde Air Products Co.
Vascoloy-Ramet Corp.

CAR PASSERS

AMERICAN MINE DOOR COM-
PANY
CANTON — SEE AMERICAN MINE
DOOR COMPANY
CARD IRON WORKS.
Mayo Tunnel & Mine Equip.
MINERS FOUNDRY & MFG. CO.
TELLURIDE IRON WORKS CO.

CAR SHAKERS

See Shakers, Car

CARS, MINE

See also Haulage Units, Off-rail

A C F Industries, Inc. American
Car & Foundry Div.
W. G. Allen & Sons (Tipton), Ltd.
ALLISON STEEL MFG. CO.
ATLAS CAR & MFG. CO., THE
BALDWIN - LIMA - HAMILTON
CORP.
Bethlehem Pacific Coast Steel Corp.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
Bischoff-Werke K. G.
CARD IRON WORKS CO., THE
C. S.
Coeur d'Alene Hardware & Foundry
Co.
DART TRUCK CO.
Differential Steel Car Co.
Distington Engineering Co., Ltd.
Easton Car & Construction Co.
George Moss Pty., Ltd.
GETMAN BROS. MFG. DIV., INC.
Gress Co., Ltd.
Hirsch Bros. Machinery Co.
Hockersmith Corp. The
Hudson, Robert, Ltd.
Irwin Foundry & Mine Car Co.
Kaiser Steel Corp.
LAKE SHORE INC.
Lands Steel Co.
LOHED — SEE LAKE SHORE, INC.
Magor Car Corp.
Mayo Tunnel & Mine Equip.
MINERS FOUNDRY & MFG. CO.
NC-1 — SEE NATIONAL MALLE-
ABLE & STEEL CASTINGS
CO.
NATIONAL IRON CO.
NATIONAL MALLEABLE &
STEEL CASTINGS CO.
Pacific Car & Foundry Co.
Sanford-Day Iron Works Co.
SCOOT-CRETE ORE CARRIER—
SEE GETMAN BROS. MFG.
DIV., INC.
TELLURIDE IRON WORKS
Union Iron Works
United States Steel Corp., Amer.
Bridge Div.
U. S. STEEL CORP., COLUMBIA
GENEVA STEEL DIV.

UNITED STATES STEEL COR-
PORATION
U. S. S. — SEE UNITED STATES
STEEL CORPORATION
UNITED STATES STEEL EXPORT
CO.

Watt Car & Wheel Co., The
Westinghouse Air Brake Co., Le
Roi Div.

AXELS, WHEELS AND TRUCKS
See above

CELLS, FLOTATION

See Flotation Machines

CHAIN AND ACCESSORIES

American Brake Shoe Co., Amer.
Manganese Steel Div.
American Chain & Cable Co., Inc.,
American Chain Div.
Amer. Hoist & Derrick Co., Crosby-
Laughlin Div.
AMSCO — SEE AMERICAN BRAKE
SHOE CO.
ELECTRIC STEEL FOUNDRY CO.
Jeffrey Manufacturing Co.
Laughlin — see Amer. Hoist & Der-
rick Co.
Laughlin Co., The, Thomas
LINK-BELT CO.
NATIONAL MALLEABLE &
STEEL CASTINGS CO.
Ohio Gear Co., The
Renold Chains Ltd.
Page Engr. Co.
Renold Chains Ltd.
Republic Steel Corp.
Rex — see Chain Belt Co., The
Ryerson & Son, Inc., Joseph T.
STEPHENS-ADAMSON MFG. CO.
Taylor-Wharton Iron & Steel Co.
Thiele, August, G.m.b.H.
Tisco — see Taylor-Wharton Iron &
Steel Co.
Thomas Laughlin Div., American
Hoist & Derrick Co.
Wilmot Engineering Co.

CHAIN HOISTS

ALLISON STEEL MFG. CO.
American Chain & Cable Co.,
Wright Hoist Div.
ATLAS COPCO AB, SWEDEN
CHICAGO PNEUMATIC TOOL CO.
Coffing Hoist Div., Duff-Norton Co.
GARDNER-DENVER CO.
GRAYBAR ELECTRIC CO., INC.
HARNISCHFEGGER CORP.
International Combustion (Export)
Ltd.
Loading — see Yale & Towne Mfg.
Co.
Oldham & Son, Ltd.
R & M — see Robbins & Myers, Inc.
Republic Steel Corp.
Robbins & Myers, Inc.
Thor Power Tool Co.
Yale and Towne Mfg. Co.

CHARGERS, BATTERY

Acme Electric Corp.
C&D Batteries, Inc.
ELECTRIC STORAGE BATTERY
CO., THE EXIDE INDUS-
TRIAL DIV.
Fairbanks, Morse & Co.
General Electric Co., Apparatus
Sales Div.
Goodman Manufacturing Company,
Mancha Storage Battery Loco-
motive Div.
Gould-National Batteries, Inc.
GRAYBAR ELECTRIC CO., INC.
Greensburg Mach. Co.
Hobart Bros. Co.
INTERNATIONAL GENERAL
ELECTRIC CO.
Kohler Co.
Lincoln-Electric Co.
Lyster-Blackstone, Inc.
Lynco Powerhouse — see Lynn
Engr. & Supply Co.
Motor Generator Corp.
Onan & Sons, Inc., D. W.
"Precision-charge" — see Lincoln
Electric Co.
Sheppard Co., R. H.
Syntron Co.
Ward Leonard Electric Co.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.
Westinghouse Electric Corp.

CHEMICAL CONCENTRATORS

See Concentrating Equipment

CHEMICALS

See Reagents and Chemicals

CHIMNEYS

Consolidated Chimney Co.
Distinguishing Engineering Co., Ltd.
HEAD WRIGHTSON, STOCKTON
FORGE LTD.

CHUTES

See Bins, Chutes and
Accessories; Feeders

CLAMPS

See Couplings, Hose; Rope, Wire
and Accessories

CLARIFIERS

See Filters, Concentrators;
Thickeners and Tanks

CLASSIFIERS

See also Cyclones

AIR

Combustion Engineering Inc., Ray-
mond Div.
Gayco-Reliance—see Universal Road
Mach. Co.
General Elec. Co. of England, Ltd.
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-
Deuts. A. G.
International Combustion Products
Ltd.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Klockner-Humboldt-Deuts. A. G.
Loesche, Germany
McNally Pittsburgh Mfg. Co.
Osborne Pulse-cone—see Osbornes
Labs., Inc.
Roberts & Schaefer
Scott's Concentrators
STURTEVANT MILL CO.
Universal Road Machinery Co.
Williams Patent Crusher & Pulver-
izer Co.

HYDRAULIC

AKINS—SEE MINE & SMELTER
SUPPLY CO., THE
Davison & Co. (Hexham) Ltd.
CONCENCO—SEE DEISTER CON-
CENTRATOR CO., THE
DEISTER CONCENTRATOR CO.,
THE
Deister Machine Co.
DENVER EQUIPMENT CO.
DORR OLIVER, INC.
Dresser Stacey Co.
Dunham Mfg. & Sales Co., Gordon
S
Eagle Iron Works
Equipment Engineers Inc.
Fraser & Chalmers Engr. Wks.
General Electric Co. of England,
Ltd.
HARDINGE CO., INC.
Heyl & Patterson, Inc.
Humboldt, Klockner-Humboldt-Deuts
AG
International Combustion Products
Ltd.
KENNEDY-VAN SAUN MFG. &
ENG.
Klockner-Humboldt-Deuts. A. G.
Knapp & Bates, Ltd.
Krebs—see Equipment Eng., Inc.
McLANAHAN & STONE CORP.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO.,
THE
Smith Engineering Works
SOUTHWESTERN ENGR. CO.
TELLURIDE IRON WORKS CO.
WEMCO—SEE WESTERN MACH.
CO.
WESTERN MACH. CO.
Wilmot Engineering Co.

MECHANICAL

AKINS—SEE MINE & SMELTER
SUPPLY CO. & HEAD
WRIGHTSON, STOCKTON
FORGE, LTD.

Bird Machine Co.
Bush Engineering & Mfg. Co.
Combustion Engineering Inc.
DENVER EQUIPMENT CO.
DORR OLIVER, INC.
Dorr-Oliver G.m.b.H.
Eagle Iron Works
Fraser & Chalmers Engr. Wks.
General Electric Co. Ltd., The
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON
FORGE LTD.
Holman Bros. Ltd.
Humboldt, Klockner-Humboldt-
Deuts. A. G.
International Combustion Products,
Ltd.
Iowa Mfg. Co.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Klockner-Humboldt-Deuts. A. G.
Knapp & Bates Ltd.
LINK-BELT CO.
Lippmann Engineering Works
Magnetic Engineering & Mfg. Co.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
MINERS FOUNDRY & MFG. CO.
Morse Bros. Machinery Co.
Roberts & Schaefer Co.
Smith Engineering Works
SOUTHWESTERN ENGINEERING
CO.
STURTEVANT MILL CO.
T. & R.—see Bush Eng. & Mfg. Co.
Truene—see Morse Bros. Machinery
Co.
Union Iron Works
WEMCO—SEE WESTERN MA-
CHINERY CO.
WESTERN MACHINERY CO.

CLEANERS

See Filters; Scrubbers

CLOTH

See Filter Media; Screens, Griz-
zles and Accessories; Ventila-
tion Equipment

CLOTHING

See Safety Equipment

CLUTCH MECHANISMS

See also Friction Material

Air-Grip (see Dodge Mfg. Co.)
Diamond-D, (see Dodge Mfg. Co.)
Dodge Mfg. Co.
Eaton Mfg. Co. Dynamatic Divsn.
General Motors Corp., New Depart-
ure Div.
I-T-E Circuit Breaker Co.
LINK-BELT CO., EXPORT DIV.
Marland One-Way Clutch Co.
Morse Chain Co.
Rolling-Grip—see Dodge Mfg. Co.
STEPHENS-ADAMSON MFG. CO.
Twine Disc Clutch Co.
The S. K. Wellman Co.

COLLECTORS

See Dust Collection Equipment;
Reagents and Chemicals

COLUMNS

See Arms and Posts

COMMUNICATIONS

BELL AND BUZZER SYSTEMS ACEC

Adaptabel—see Edwards Co., Inc.
Adaptaborn—see Edwards Co., Inc.
Connecticut Telephone & Electric
Corp.
John Davis & Son, Ltd.
General Electric Co. of England,
Ltd.
GRAYBAR ELECTRIC CO., INC.

Lunger—see Edwards Co., Inc.
Signal Engr. & Mfg. Co.
Sterling Siren Fire Alarm Co., Inc.
United States Instrument Corp.

MINE TELEPHONES ACEC

Connecticut Telephone & Electric
Corp.
Fraser & Chalmers Engr. Wks.
General Electric Co. of England,
Ltd.
GRAYBAR ELECTRIC CO., INC.
Mine Safety Appliances Co.
SIMPLEX WIRE & CABLE CO.
Sound Power, see United States In-
strument Corp.
Sterling Siren Fire Alarm Co., Inc.
United States Instrument Corp.

RADIO SYSTEMS ACEC

Connecticut Telephone & Electric
Corp.
Fleetway—see Connecticut Tele-
phone & Electric Corp.
General Electric Co. of England,
Ltd.
GRAYBAR ELECTRIC CO., INC.
Hycan Aerial Surveys, Inc.
INTERNATIONAL GENERAL
ELECTRIC CO.
International Geophysics, Inc.
Mine Safety Appliances Co.
Motorola Communications & Elec-
tronics, Inc.
Sterling Siren Fire Alarm Co., Inc.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.

TROLLEY TELEPHONES

Mine Safety Appliances Co.
Sterling Siren Fire Alarm Co., Inc.

COMPRESSORS &

ACCESSORIES

PORTABLE

Techn. Ind. & Handelsondernemine
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
American Brake Shoe Co., Ameri-
can Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN
ATLAS COPCO PACIFIC, INC.
Borsig AG.
Carrier Corp.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co.
Davy Compressor Co.
Demag Aktiengesellschaft
GARDNER-DENVER CO.
Goodman Mfg. Co.
GYRO-FLOW—SEE INGERSOLL-
RAND CO.
Holman Bros., Ltd. (England)
Holman Brothers (Canada) Limited
Humboldt, Klockner-Humboldt-Deuts
AG
INGERSOLL-RAND CO.
Jaeger Machine Co., The
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air
Brake Co.
Mosebach Electric & Supply, Mose-
bach Mfg. Co.
Mackay Industrial Equipment, Ltd.
Olin Mathieson Chem. Corp., Explo-
sives Div.
Power-Vane, see Consolidated Pneu-
matic Tool Co., Ltd.
Powerite Drill & Tool Co.
Ruston & Hornsby Ltd.
Schrann Inc.
Texas Gulf Sulphur Co.
UNTAIR—SEE JOY MANUFAC-
TURING CO.
Westinghouse Air Brake Co., Le
Roi Div.
Westinghouse Air Brake Co. (Pa.)
Worthington Corp.

STATIONARY

Techn. Ind. & Handelsondernemine

Concentrating Equipment

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
American Blower Div. of American
Standard
AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Borsig AG.
Belliss & Morcom Ltd.
Carrier Corp.
CHICAGO PNEUMATIC TOOL
CO.
Consolidated Pneumatic Tool Co.,
Ltd.
Cooper-Bessmer Corp., The
DeLaval Steam Turbine Co.
Demag Aktiengesellschaft
GARDNER-DENVER CO.
General Electric Co. of England,
Ltd.
Humboldt, Klockner-Humboldt-Deuts
AG
Holman Bros., Ltd., (England)
Holman Brothers (Canada) Limited
Humboldt, Klockner-Humboldt-
Deuts. AG
INGERSOLL-RAND CO.
Jaeger Machine Co., The
JOY MANUFACTURING CO.
Lima Electric Motor Co., The
Mackay Industrial Equipment Ltd.
Olin Mathieson Chem. Corp., Explo-
sives Div.
RO-FLO—SEE ALLIS-CHAL-
MERS MFG. CO., INDUS-
TRIES GROUP
Ruston-Connersville Blower Corp.
Ruston & Hornsby Ltd.
Schrann Inc.
Spiraxial—see Ruston-Connersville
Blower
Texas Gulf Sulphur Co.
Techn. Ind. & Handelsondernemine
Wedag A.G.
Westinghouse Air Brake Co., In-
dustrial Products Div.
Westinghouse Air Brake Co., Le
Roi Div.
Worthington Corp.

CONCENTRATING

EQUIPMENT

See also Classifiers; Flotation
Machines, Magnetic Equipment;
Grinding Equipment; Crushers;
Separators

HEAVY MEDIA SEPARATION

AKINS—SEE MINE & SMELTER
SUPPLY CO., THE
ALLIS-CHALMERS MFG. CO., IN-
DUSTRIES GROUP
Dings Magnetic Separator Co.
Dorr-Oliver G.m.b.H.
DRAYO CORP.
Filter Fabrics, Inc.
Fraser & Chalmers Engr. Wks.
General Electric Co., Ltd., The
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON
FORGE LTD.
HEWITT-ROBINS, INC.
Humboldt Klockner-Humboldt-
Deuts. A. G.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. &
ENGR. CORP.
Klockner-Humboldt-Deuts. A. G.
LINK-BELT CO.
Magnetic Engineering & Mfg. Co.
McNally Pittsburgh Mfg. Co.
Memco—see Magnetic Engineering
& Mfg. Co.
MINE & SMELTER SUPPLY CO.,
Morse Bros. Mach. Co.
O. C. C.—see Ore & Chemical Co.
Ore & Chemical Co.
Osborne Laboratories, Inc. Ray-
mond G.
Rapid Magnetic Machines, Ltd.
Simplicity Engineering Co.
SOUTHWESTERN ENGR. CO.
Stearns Magnetic
STEARNS-ROGER MFG. CO., THE
TENNANT SONS & CO., C., OF
N.Y.
WEMCO MOBILE-MILL—SEE
WESTERN MACHINERY CO.
WESTERN MACHINERY CO.
Wilmot Eng. Co.
Yuba Consolidated Industries, Inc.

**Manufacturer's Complete Names and Ad-
resses are listed in Section II, last pages
of this yellow section. Firms appearing in
boldface caps carry advertisements in
this issue.**

Ion Exchange Equipment

ION EXCHANGE EQUIPMENT

Dorr—Oliver G.m.b.H.
Permutit Co. The
STEARNS-ROGER MFG. CO., THE

FANNING

Carpeo Mfg. Co.
Ion Exchange Equipment
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
DENVER EQUIPMENT CO.
DORR-OLIVER CO.
HACK ENGINEERING CO.
INFILCO, INC.
Peterson Filters & Engineering Co.
SOUTHWESTERN ENGINEERING CO.
STANDARD STEEL CORP.
STEARNS-ROGER MFG. CO.
TYLER CO., W. S.
Universal Dredge Mfg. Co.
WESTERN MACHINERY CO.

JIGS

Bavaria Maschinenfabrik
Bendelari, F. H.
Coeur d'Alene Hardware & Foundry Co.
DENVER EQUIPMENT CO.
Dorr-Oliver G.m.b.H.
Fraser & Chalmers Engr. Wks.
General Electric Co. Ltd., The
Hirsch Bros. Machy. Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
James Equipment Inc.
Jeffrey Manufacturing Co.
"Jimmy"—see James Equipment, Inc.
KENNEDY-VAN SAUN MFG. CO.
Knapp & Bates, Ltd.
Klockner-Humboldt-Deutz A. G.
Krupp, Fried-Maschinen und Stahlbau Rheinhausen
LINK-BELT CO.
MCCLANAHAN & STONE CORP.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
Morse Bros. Machinery Co.
Osborne Laboratories, Inc., Raymond G.
Universal Dredge Mfg. Co.
WEMCO-REMER—SEE WESTERN MACHY. CO.
Worf Conrad & Stork Hirsch
WESTERN MACHY. CO.
Wilmot Eng. Co.
Yuba Mfg. Div.

SPIRAL CONCENTRATORS

DENVER EQUIPMENT CO.
Fraser & Chalmers Engr. Wks.
General Electric Co. Ltd., The
Humphreys Investment Co.
Jeffrey Mfg. Co.

TABLES

Bavaria Maschinenfabrik
BUCKMAN TILING CONCENTRATOR—SEE DENVER EQUIP. CO.
Carpeo Mfg. Inc.
CENCO—SEE DEISTER CONCENTRATOR CO. THE
DEISTERPLAT-O—SEE DEISTER CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
Deister Machine Co.
DENVER EQUIPMENT CO.
Dunham Mfg. & Sales Co., Gordon S.
Fraser & Chalmers Engr. Wks.
General Electric Co. of England, Ltd.
Holman Bros. Ltd.
Humboldt, Klockner-Humboldt-Deutz, A. G.
James Equipment, Inc.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
LINK-BELT CO., EXPORT DIV.
MINE & SMELTER SUPPLY CO.
Minerals et Metaux
Morse Bros. Machinery Co.
Osborne Laboratories, Inc., Raymond G.
Roberts & Schaefer Co.
Scott's Concentrators
Snyder Mine & Chemical Lab.
SUPER DUTY DIAGONAL-DECK—SEE DEISTER CONCENTRATOR CO.
Universal Dredge Mfg. Co.
WILFLEY—SEE MINE & SMELTER SUPPLY CO. THE
Yuba Manufacturing Co.

CHEMICAL CONCENTRATORS

Humboldt, Klockner-Humboldt-Deutz, A. G.

INFILCO, INC.
KENNEDY-VAN SAUN MFG. & CO.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
Snyder Mine & Chemical Lab.
STEARNS-ROGER MFG. CO.
WESTERN MACHY. CO.

CONCRETING EQUIPMENT, UNDERGROUND

See also Grouting
Air Placement Equip. Co.
Airplace—see Air Placement Equip. Co.
Blaw-Knox Co.
Bondact—see Air Placement Equip. Co.
CEMENT GUN CO.
Cementation Co. Ltd., The
Chain Belt Co.
CHICAGO PNEUMATIC TOOL CO.
Construction Mach. Co.
Grout-or Blast—see Air Placement Equip. Co.
GUNITE—SEE CEMENT GUN CO.
Jaeger Machine Co., The
Mayo Tunnel & Mine Equip.
Mix-elevator—see Air Placement Equip. Co.
Nucrotor—see Air Placement Equip. Co.
Rex—see Chain Belt Co.
Torkret G.m.b.H.

CONDITIONERS

See Agitators and Conditioners;
Engine Exhaust Conditioners

CONDUIT

See Cable and Conduit

CONSTRUCTION, MINE PLANT

See Plant Design and Construction

CONSULTING

METALLURGICAL ENGINEERS

Booth Co., Inc., The
Braun & Co., C. F.
Carpeo Manufacturing, Inc.
ELECTRIC STEEL FOUNDRY CO.
Humboldt, Klockner-Humboldt-Deutz AG
Kaiser Engineers
Knapp & Bates Limited
Krebs, Kellogg
Leduc & Co.
Liquid-Solid Separations Ltd.
McDowell Co., Inc.
SOUTHWESTERN ENGINEERING CO.
STEARNS-ROGER MFG. CO., THE
Talbot, H. L.

CONSULTING MINING

ENGINEERS AND SERVICES

Carpeo Manufacturing, Inc.
CHAPMAN, WOOD & GRISWOLD
COWIN & CO., INC.
Dale Wade M.
Davis & Davis
Earle, Norton K.
FREDERICK, FRANCIS H.
Geo-Engineering
GOULD & CO., GORDON I.
Heinrichs Geoporation Co., P.O.
Box 5671, Tucson, Ariz.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Ingersoll, Guy E.
Kaiser Engineers
Kane, Wm. G.
Link-Belt Co.
Lints, Mark
LONGYEAR CO., E. J.
LOOFBOUROW, R. L.
MacAfee & Co.
McMillan, W. D.
Miller, Arnold H.
O'DONNELL & SCHMIDT
Pena Associates

Pierce, Roger V.
Piggott Projects
Pinger, Allen W.
Schaefer & Associates, F. C.
SCHREIDENHELM, F. W.
Scott's Concentrators
Sherman, Howard P.
SOUTHWESTERN ENGINEERING CO.

Stearns-Roger Mfg. Co., The
STILL & STILL
THOMAS, CONRAD W.
TURNER & ASSOCIATES
Urino-Grand Junction Uranium Instruments Co.
EARL C. VAN HORN
WISER & COX
Harry J. Wolf
Wilson Exploration Co.
World Mining Consultants Inc.

CONTINUOUS MINERS

Anderson, Boyes & Co. Ltd.
Goodman Mfg. Co.
Distington Engineering Co., Ltd.
Jeffrey Mfg. Co.
JOY MFG. CO.
NATIONAL MINE SERVICE CO.
Scott's Concentrators
Westinghouse Air Brake Co., Ltd.
Roi Div.

CONTROLS

See also Gauges and Scales

ELECTRIC MOTOR

ACEC
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Carpeo Manufacturing, Inc.
Fraser-Chalmers Eng. Works
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Wadsworth Elec. Mfg. Co., Inc.

ELECTRONIC

ABCs Scale Div., The McDowell Co.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
English Drilling Equipment Co.
INDUSTRIAL PHYSICS & ELECTRONICS CO.

HYDRAULIC

American Brake Shoe Co.
Commercial Shearing & Stamping Co., Inc.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
INFILCO, INC.

MILL

ABCs Scale Div., The McDowell Co.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Analytical Measurements, Inc.
Beckman Instruments, Inc., Scientific Instruments Div.
BENDIX AVIATION CORP.
Bristol Co., The
Euclid Electric & Mfg. Co.
Fischer & Porter Co.
General Electric Co., Apparatus Sales Div.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
INFILCO, INC.
LINK-BELT CO.
MASSCO-ADAMS-SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
Norwood Controls Unit.
Philadelphia Gear Works, Inc.
Reliance Electric & Engineering Co.
Westinghouse Electric Corp.

PNEUMATIC

ABCs Scale Div., The McDowell Co.
English Drilling Equipment Co.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Infilco, Inc.
Westinghouse Air Brake Co., Industrial Products Div.

PYROMETALLURGICAL

ABCs Scale Division, McDowell Co., Inc.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Bristol Co., The
Foxboro Co., The
General Electric Co., Apparatus Sales Div.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Inc.
Pyro-see Pyrometer Instrument Co., Inc.
Pyrometer Instrument Co., Inc.
Weston Instruments, Div. of Dayton, Inc.
Wheel Co., Instruments Div.

CONVERTERS

See Electrical Equipment; Pyrometallurgical Equipment; Transmissions

CONVEYOR EQUIPMENT

See also Scales

BELTS

AMERICAN BRAKE SHOE CO.,
American Rubber Mfg. Co.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
Bear—see American Rubber Co.
Becker-Fruntz, G.m.b.H.
Bischoff-Werke K. G.
Bonded Scale & Machine Co.
Boston Woven Hose & Rubber Co.
British Ropeway Engineering Co. Ltd.
Carlyle Rubber Co., Inc.
Chain Belt Co.
Continental Gln Co.
Crackerjack—see American Rubber Co.
Davison & Co. (Hexham) Ltd.
Demag Aktiengesellschaft
Distington Engineering Co., Ltd.
Eickhoff, Gebr. Maschinenfabrik A. Eisengieserei G.m.b.H.
Equipment Eng. Inc.
Fraser & Chalmers Engr. Wks.
Gates Rubber Co.
GOODALL RUBBER CO.
Goodrich Rubber Co.
Goodrich Co., B. F., Industrial Prod. Div.
Goodyear Tire & Rubber Co.
Grundiger Crusher & Pulverizer Co.
HACK ENG. CO.
Haiso Mfg. Co., Inc., Geo.
HEWITT-ROBINS INC.
Homocord—see Raybestos-Manhattan, Inc.
Humboldt, Klockner-Humboldt-Deutz AG
INTERNATIONAL B. F. GOODRICH
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
Jeffrey Mfg. Co., The
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Korb-Pettit Wire Fabrics & Iron Wks., Inc.
Lee Rubber & Tire Corp., Republic Rubber Div.
LINK-BELT CO.
Magnetic Engineering & Mfg. Co.
MAYO TUNNEL & MINE EQUIPMENT
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
National Mine Service Co.
Pohl, J., A. G.
PORTER CO., H. K., QUAKER RUBBER CO. DIV.
Quaker Pioneer Rubber Mills
QUAKER RUBBER CO.—SEE PORTER CO., H. K.
Raybestos-Manhattan, Inc.
Ray-man—see Raybestos-Manhattan Co.
Record-Maker—see Lee Rubber & Tire Corp., Republic Rubber Div.
Republic Rubber Div., Lee Rubber & Tire Corp.
Rex—see Chain Belt Co.
Richardson Scale Co.
Rubber Improvement Ltd.
Smith Engineering Works
Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
Stubbs, Albert
Super Excello—see Lee Rubber & Tire Corp., Republic Rubber Div.

Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
THERMOID CO.
Thiele, August G.m.b.H.
Thor Power Tool Co.
TREADWELL CO., INC., M. H.
Trowbridge—see Magnetic Engineering & Mfg. Co.
Turner Bros. Asbestos Ltd.
United States Rubber Intl.
U. S. STEEL EXPORT CO.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Western Foundry Co.
Yuba Manufacturing Div.
Yosemite—see American Rubber Mfg. Co.

BUCKETS

American Brake Shoe Co., Amer. Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
 Bonded Scale & Machine Co.
 Chain Belt Co.
 Christian Engineers, J. D.
COLUMBIA STEEL CASTING CO., INC.
 Continental Gin Co.
 Equipment Eng. Inc.
 Fa. Tenn. Pac. & Co.
 General Electric Co. of England, Ltd.
 Gruendler Crusher & Pulverizer Co.
HACK ENG. CO.
HEWITT-ROBINS, INC.
 Humboldt, Klockner-Humboldt-Deutz AG
 International Combustion Products Ltd.
 Iowa Manufacturing Co.
 Irwin Foundry & Mine Car Co.
 Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
 Klockner-Humboldt-Deutz A. G.
 Koehring Co., Johnson Co., C. S., a subd.
LINK-BELT—SEE LINK-BELT CO.
 Lippmann Engineering Works
 Magnetic Engineering & Mfg. Co.
 McDowell Co., Inc.
 McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NATIONAL IRON CO.
 Owen Bucket Co., The
 Pioneer Eng. Div. Poor & Co., Inc.
 Rex—see Chain Belt Co.
 Rogers Iron Works Co.
 Salem Tool Co.
 Sanford-Day Iron Works, Inc.
 Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
 Stubbs, Albert
 Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
 Trowbridge—see Magnetic Engineering & Mfg. Co.
 Thik-Lip—see Christian Engineers, J. D.
 Universal Dredge Mfg. Co.
 Universal Engineering Corp.
 Watt Car & Wheel Co., The
 Western Foundry Co.
 Wilmot Engr. Co.
 Yuba Manufacturing Div.

DRIVE AND TAIL PULLEYS

ACF Industries, Inc., American Car & Foundry Div.
AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
 Bonded Scale and Machine Co.
 Chain Belt Co.
 Christian Engineers, J. D.
 Continental Gin Co.
 Curve Crown—see Stephens-Adamson Mfg. Co.
 Demag Aktiengesellschaft
 Dowty Mining Equipment Ltd.
 Equipment Eng., Inc.
 Dodge Manufacturing Corp.
 General Electric Co. Ltd., The
 Gruendler Crusher & Pulverized Co.
HADFIELD LTD.
 Hais Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.
 Iowa Manufacturing Co.
 Irwin Foundry & Mine Car Co.
 Jeffrey Manufacturing Co.
JOY MANUFACTURING CO.
 Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.
 Lippmann Engineering Works
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 Pioneer Engineering, Div. Poor & Co., Inc.
 Pohl, J. A. G.
 Rex—see Chain Belt Co.
 Rogers Iron Works Co.
SKOOKUM CO., INC., THE
 Smith Engineering Works
 Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
 Stubbs, Albert
 Richard Sutcliffe, Ltd.
 Taper-Loek—see Dodge Mfg. Co.
 Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
TREADWELL CO., INC., M.H.
 Universal Dredge Mfg. Co.
 Universal Engineering Corp.
 Wamco—see Washington Mach. Co.
 Washington Mach. Co.
 Wedg-Grip—see Christian Engineers, J. D.

Western Foundry Co.
 Yuba Manufacturing Div.

IDLERS

American Brake Shoe Co., American Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
 Bonded—see Bonded Scale & Machine Co.
 Bonded Scale & Machine Co.
 British Jeffrey-Diamond Ltd.
 Chain Belt Co.
 Christian Engineers, J. D.
 Continental Gin Co., Industrial Div.
 Equipment Eng., Inc.
 Fraser & Chalmers Engr. Wks.
 General Electric Co., Ltd., The
 Goodyear Tire & Rubber Co.
 Gruendler Crusher & Pulverizer Co.
HACK ENG. CO.
 Hais Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.
 International Combustion (Export) Ltd.
 Iowa Manufacturing Co.
 Irwin Foundry & Mine Car Co.
 Jeffrey Manufacturing Co.
JOY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
LINK-BELT—SEE JOY MFG. CO.
LINK-BELT CO.
 Lippmann Engineering Co., E. F.
 McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL CO.
 Pettibone Mulliken Corp.
 Pioneer Engineering Div., Poor & Co., Inc.
 Pohl, J. A. G.
 Rex—see Chain Belt Co.
 Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
 Stubbs, Albert
 Richard Sutcliffe, Ltd.
 Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS
TREADWELL CO., INC., M. H.
 Universal—see Hack Eng. Co.
 Universal Dredge Mfg. Co.
 Universal Engineering Corp.
 Western Foundry Co.
 Yuba Manufacturing Co.

PILLOW BLOCKS AND HANGERS

American Brake Shoe Co., American Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Bonded Scale & Machine Co.
 Christian Engineers, J. D.
 Continental Gin Co., Industrial Div.
 Dodge Manufacturing Corp.
 Equipment Eng., Inc.
 General Electric Co. Ltd., The
 General Motors Corp., New Departure Div.
 Graphite Metallizing Corp.
 Gruendler Crusher & Pulverizer Co.
HADFIELD LTD.
 Hais Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.
 Iowa Manufacturing Co.
 Jeffrey Manufacturing Co.
LINK-BELT CO.
 McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 Rex—see Chain Belt Co.
 S K F Industries, Inc.
SEALMASTER—SEE STEPHENS-ADAMSON MFG. CO.
SKOOKUM CO.
STEPHENS-ADAMSON MFG. CO.
 Stubbs, Albert
TELLURIDE IRON WKS.
 Universal Engineering Corp.
 Western Foundry Co.
 Yuba Manufacturing Div.

CONVEYORS AND ELEVATORS

ELEVATORS

See also Feeders

BELT CONVEYORS

American Brake Shoe Co., American Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Athey Products Corp.
 Aveling-Barford
BARBER-GREENE CO.
 Bonded Scale and Machine Co.
 Boston Woven Hose & Rubber Co.
 British Jeffrey-Diamond Ltd.
 Broadbent, Robert & Son, Ltd.
 Butler Mfg. Co.
 Carlyle Rubber Co., Inc.
 Carpeo Mfg. Inc.
 Chain Belt Co.
 Christian Engineers, J. D.
 Continental Gin Co.
 Crackerjack—see American Rubber Mfg. Co.
 Demag Aktiengesellschaft
DENVER EQUIPMENT CO.
 Eickhoff, Gebr. Maschinenfabrik u. Eisengiesserei G.m.b.H.
 Erie Maschinenbau
 Fraser & Chalmers Engr. Wks.
GOODALL RUBBER CO.
 Goodman Manufacturing Co.
 Goodrich Co., B. F. Industrial Prod. Div.
 Gruendler Crusher & Pulverizer Co.
HACK ENG. CO.
 Hais Mfg. Co., Inc., Geo.
 Henschel, Hermann Maschinenfabrik
HEWITT-ROBINS, INC.
HEWITT-ROBINS, INC. ROBINS CONVEYORS DIV.
 Hirsch Bros. Machinery Co.
 Humboldt, Klockner - Humboldt-Deutz, A. G.
INTERNATIONAL B. F. GOOD-RICH
 International Combustion (Export) Ltd.
 Iowa Manufacturing Co.
 Irwin Foundry & Mine Car Co.
 Jeffrey Manufacturing Co.
JOY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENGR. CO.
 Klockner-Humboldt-Deutz, A. G.
 Korb-Pettit Wire Fabrics & Iron Works, Inc.
LAKE SHORE, INC.
 Landis Steel Co.
 Lee Rubber & Tire Corp., Republic Rubber Div.
LINK-BELT—SEE JOY MFG. CO.
LINK-BELT CO.
 Lippmann Engineering Works
 Magnetic Engineering & Mfg. Co.
 Mavor & Coulson Ltd.
 Mayo Tunnel & Mine Equip.
 McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
MINERS FOUNDRY & MFG. CO.
 Morse Bros. Machinery Co.
 National Iron Co.
 Oliver Corp., The A. B. Farquhar Div.
 Pettibone Mulliken Corp.
 Peggion Ltd.
 Pioneer Engineering Div., Poor & Co., Inc.
 Pioneer Rubber Mills
PORTER CO., INC., H. K. QUAKER RUBBER DIV.
QUAKER PIONEER RUBBER MILLS
QUAKER RUBBER CO.
 Raybestos-Manhattan, Inc.
 READY-SPAN—SEE JOY MFG. CO.
REDI-PAB, SEE BARBER-GREENE CO.
 Republic Rubber Div., Lee Rubber & Tire Corp.
 Rex—see Chain Belt Co.
 Rogers Iron Works Co.
 Salzgitter Maschinen Aktiengesellschaft
 Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
TELLURIDE IRON WKS.
 Thiele, August G.m.b.H.
THERMOID CO.
 Thor Power Tool Co.
TREADWELL CO., INC., M. H.

Trowbridge—see Magnetic Engineering & Mfg. Co.
 United States Rubber Co.
 United States Rubber Ind. U. S. STEEL EXPORT CO.
 Universal Dredge Mfg. Co.
 Universal Engineering Corp.
 Washington Machinery Co.
 Westfälische Maschinenbau G.m.b.H.
 Wood & Co. Ltd., Hugh
 Yosemite—see American Rubber Mfg. Co.

BUCKET ELEVATORS

American Brake Shoe Co., American Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Aveling-Barford
BARBER-GREENE CO.
 Bonded Scale & Machine Co.
 Butler Mfg. Co.
 Carpeo Mfg. Inc.
 Chain Belt Co.
 Christian Engineers, J. D.
COLUMBIA STEEL CASTING CO., INC.
 Continental Gin Co., Industrial Div.
 Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.
 General Electric Co. of England, Ltd.
 Gruendler Crusher & Pulverizer Co.
HACK ENG. CO.
HEWITT-ROBINS, INC.
 Hirsch Bros. Machinery Co.
 Humboldt, Klockner - Humboldt-Deutz, A. G.
INTERNATIONAL B. F. GOOD-RICH
 International Combustion (Export) Ltd.
 Iowa Manufacturing Co.
 Jeffrey Manufacturing Co. The
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
 Klockner-Humboldt-Deutz, A. G.
 Koehring Co., Johnson Co., C. S., a subd.
LAKE SHORE, INC.
 Landis Steel Co.
LINK-BELT CO.
 Lippmann Engineering Works
 Magnetic Engineering & Mfg. Co.
MCANAHAN & STONE
 Oliver Corp., The A. B. Farquhar Div.
 Peggion Ltd.
 Pettibone Mulliken Corp.
 Pioneer Engineering Div., Poor & Co., Inc.
 Rogers Iron Works Co.
 Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
 Richard Sutcliffe, Ltd.
 Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
TREADWELL CO., INC., M. H.
 Trowbridge—see Magnetic Engineering & Mfg. Co.
 Universal Dredge Mfg. Co.
 Universal Engineering Corp.
 Washington Machinery Co.
 Watt Car & Wheel Co.
 The Wilmot Engineering Co.
 Yuba Manufacturing Div.

CHAIN CONVEYORS

Bonded Scale & Machine Co.
 Jeffrey Mfg. Co., The
LINK-BELT CO.
 Oliver Corp., The A. B. Farquhar Div.
STEPHENS-ADAMSON MFG. CO.

PNEUMATIC

Convair, Inc.
 Spencer Turbine Co., The
 Eries Manufacturing Co.
 Flour Hartman, Div. Flour Products Co. Hartman A. G., Maschinenfabrik
 Humboldt, Klockner-Humboldt-Deutz AG
 U. S. Hoffman Machinery Corp.

SCREW

American Brake Shoe Co., American Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Bonded Scale & Machine Co.
 Carpeo Mfg. Inc.
 Chain Belt Co.
 Coeur d'Alene Hardware & Foundry Co.
 Continental Gin Co., Industrial Div.
 Davison & Co. (Hexham) Ltd.
 Equipment Engineering Co.

Coolers

Grondler Crusher & Pulverizer Co.
HACK ENGINEERING CO.
Hevi-Edge—see Christian Engineers,
J. D.
Hirsch Bros. Machinery Co.
MOLO-FLITE—SEE WESTERN
PRECIPITATION CO.
Humboldt, Klockner - Humboldt-
Deuts. A. G.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. &
ENGR. CORP.
Klockner-Humboldt-Deuts. A. G.
Koeching Con. Johnson Co., C. S.
Lendle Steel Co.
LINK-BELT CO.
Lippmann Engineering Works
MINERS FOUNDRY & MFG. CO.
Pettibone Mulliken Corp.
Pioneer Engr. Div., Poor & Co.,
Inc.
Rex—see Chain Belt Co.
Richardson Scale Co.
STURTEVANT MILL CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
Watt Car & Wheel Co., The
WESTERN PRECIPITATION CO.

SHAKING OR VIBRATING

Anderson, Boyes & Co. Ltd.
Bonded Scale & Machine Co.
Carpco Mfg. Inc.
Carrier Conveyor Corp.
Cleveland Vibrator Co., The
Continental Gin Co.
Distington Engineering Co., Ltd.
DRAYO CORP.
Fraser & Chalmers
General Electric Co., Ltd.
The Goodman Manufacturing Co.
Grondler Crusher & Pulverizer Co.
HACK ENG. CO.
Hauhinco, Maschinenfabrik
HEWITT-ROBINS, INC.
Humboldt, Klockner - Humboldt-
Deuts. A. G.
Internatl Combustion (Exports) Ltd.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. &
ENGR. CORP.
Klockner-Humboldt-Deuts. A. G.
LINK-BELT CO.
Lippmann Engineering Works
Overstrom & Sons
Richardson Scale Co.
Scottis Concentrators
Simplicity Engr. Co.
SMITH & CO., F. L.
Stahlwerke Dillmann G.m.b.H.
STEPHENS-ADAMSON MFG. CO.
Syntro Co.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Vulcan Iron Wks., Inc.
Watt Car & Wheel Co., The

STEEL PLATE

Bonded Scale & Machine Co.
Humboldt, Klockner-Humboldt-Deuts.
AG
Link-Belt Co.
Wettfalsche Maschinenbau G.m.b.H.
Wharton Engineers, Ltd.

COOLERS

See also Dryers and Kilns
ALLIS-CHALMERS MFG. CO.
American Brake Shoe Co., American
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Braun & Co., C. F.
Carrier Conveyor Corp.
Carrier Corp.
Christian Engineers, J. D.
DRAYO CORP.
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON
FORGE LTD.
MOLO-FLITE—SEE WESTERN
PRECIPITATION CORP.
Humboldt, Klockner-Humboldt-Deuts.
AG
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. &
ENGR. CORP.
Klockner-Humboldt-Deuts. A. G.
LINK-BELT CO.
Nichols Engineering & Research
Corp.
NORDBERG MFG. CO.
PACIFIC FOUNDRY CO., LTD.
Roto-Louvre—see Link-Belt Co.
SMITH & CO., F. L.
STANDARD STEEL CORP.
STEARNS-ROGER MFG. CO.

Surface Combustion Corp.
TRAYLOR ENGR. & MFG. CO.
The Visco Engr. Co.
Washington Machinery Co.
WESTERN PRECIPITATION
CORP.
WINDELER CO., LTD., GEORGE

COOLERS, MINE

Carrier Corp.

COOLING TOWERS

See also Dryers and Kilns

Carrier Corp.
Foster Wheeler Corp.
Humboldt, Klockner-Humboldt-Deuts.
AG
NATIONAL TANK & PIPE CO.
SANTA FE TANK DIV., FLOUR
PRODUCTS CO.
The Visco Engr. Co.
WINDELER CO., LTD., GEO.
Yuba Consolidated Indus., Mining
Div.

CORE BARRELS

ACKER DRILL CO., INC.
American Coldset Corp.
Boyles Bros. Drilling Co. Ltd.,
(Canada)
DIAMOND DRILL CONTRACT-
ING CO.
English Drilling Equipment Co.
Hitchcock Mfg. Co., Leo
JOY MFG. CO.
Marvey Supply Co., Inc.
SPRAGUE & HENWOOD, INC.
Winter-Weiss Co., The

COPYING EQUIPMENT

BLUEPRINT MACHINES
WHITEPRINT MACHINES
BUSINESS PHOTOCOPY
MACHINES

COUNTERS, GEIGER,

OR SCINTILLATION

See Geiger Scintillation Counters

COUPLERS, CAR

AUTOMATIC—SEE NATIONAL
MALLEABLE & STEEL CAST-
INGS CO.
CARD IRON WORKS CO., THE
C. S.
Coeur d'Alene Hardware & Foundry
Co.
Differential Steel Car Co.
EIMCO CORP., THE
English Steel Corp.
Gregg Co., Ltd.
Irwin Foundry & Mine Car Co.
Mayo Automatic—see Mayo Tunnel
& Mine Equip.
Mayo Tunnel & Mine Equip.
MINERS FOUNDRY & MFG. CO.
NATIONAL MALLEABLE &
STEEL CASTINGS CO.
Ohio Brass Co.
Sanford-Day Iron Works Inc.
Umeco—see Utility Mine Equip-
ment Co.
Utility Mine Equipment Co.
WILLISON — SEE NATIONAL
MALLEABLE & STEEL CAST-
INGS CO.

COUPLINGS

See also Transmissions

HOSE

ATLAS COPCO AB, SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Band-It Co.
Boston Woven Hose & Rubber Co.
CHICAGO PNEUMATIC TOOL
CO.
Chiksan Co.
Cleveland Div., Westinghouse Air
Brake Co.
Consolidated Pneumatic Tool Co.,
Ltd.
Gates Rubber Co.
GOODALL RUBBER CO.
Holman Bros. Ltd.
Hose Accessories Co., Le-Hi Div.
Ideal Corp.
INTERNATIONAL B. F. GOOD-
RICH

Le Hi Champ—see Hose Accessories
Co.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
Pioneer Rubber Mills
Punch-Lok Co.
Stewart-Warner Corp.
THERMOID CO.
Thor Power Tool Co.
Trabon Engineering Corp.
U. S. Rubber Intl.

PIPE

ATLAS COPCO AB, SWEDEN
ATLAS COPCO PACIFIC, INC.
Band-It Co.
Bethlehem Steel Co.
Chiksan Co.
FOOD MACHINERY & CHEM.
CORP., JOHN BEAN DIV.
GOODALL RUBBER CO.
Grinnell Co., Inc.
Gravagrip—see Gustin-Bacon Mfg.
Co.
Gravajoint—see Gustin-Bacon Mfg.
Co.
Gustin-Bacon Mfg. Co.
International Coupler Co.
INTERNATIONAL B. F. GOOD-
RICH
Johns-Manville Sales Corp.
Manning Co., Chas. E.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
NATIONAL SUPPLY CO. (Pa.)
PACIFIC PIPE CO.
Ring-Tite—see Johns-Manville
Relagrip—see Gustin-Bacon Mfg.
Co.
Spang—see National Supply Co.
(Pa.)
Taylor Forge & Pipe Works
Thor Power Tool Co.
Victaulic Co. of America
Walworth Co.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.

SHAFT & SHAFT FLEXIBLE

Airflex—see Falk Corp., The
BROWN, INC., DAVID
Brown Corp. (Sales) Ltd., David
Chain Belt Co.
Continental Gin Co.
Dodge Mfg. Corp.
Falk Corp., The
Farrel-Bacon—see Farrel-Birming-
ham Co., Inc.
Farrel-Birmingham Co., Inc.
Fast's Self-aligning—see Koppers
Co. Ind. Metal Prod. Div.
HEWITT-ROBINS, INC.
Jeffrey Manufacturing Co.
Koppers Co., Inc., Metal Prods. Div.
LINK-BELT CO.
Morso Chain Co.
Pana-Flex—see Dodge Mfg. Corp.
Philadelphia Gear Wks., Inc.
Renold Chains Ltd.
Rex—see Chain Belt Co.
Steelflex—see Falk Corp., The
Tanco-Low—see Dodge Mfg. Co.
Thomas Flexible Coupling Co.
Twin Disc Clutch Co.

CRANES

BRIDGE

ALLISON STEEL MFG. CO.
American Chain & Cable Co.
Wright Hoist Div.
American Hoist & Derrick Co.,
Cresby-Laughlin Div.
American M.A.N. Corp.
Demag Aktiengesellschaft
DRAYO CORP.
HACK ENGINEERING CO.
HARNISCHFEGGER CORP.
Hevi & Patterson, Inc.
Mannesmann Export G.m.b.H.
McDowell Co., Inc.
Ohio Hoist & Mfg. Co.
Pitman Manufacturing Co.
Robbins & Myers, Inc.
Schoonmaker Co., Inc., P. G.
Shepard Niles Crane & Hoist Corp.
STEARNS-ROGER MFG. CO.
THUNES MEK. VERKSTED, A. S.
United States Steel Corp., American
Bridges Div.
Universal Dredge Mfg. Co.
Vaughan Crane Co., Ltd.
Wellman Engineering Co., The
Yuba Mining Div., Yuba Consolidated
Industries, Inc.

JIB

American Chain & Cable Co.
Wright Hoist Div.
American Hoist & Derrick Co.,
Cresby-Laughlin Div.
American M.A.N. Corp.
Austin-Western & Lima A. W.
BALDWIN - LIMA - HAMILTON
CORP.

Clyde Iron Wks., Inc.
Demag Aktiengesellschaft
HACK ENGINEERING CO.
HARNISCHFEGGER CORP.
LE TOURNEAU-WESTINGHOUSE
CO.

Ohio Hoist & Mfg. Co.
Shepard Niles Crane & Hoist Corp.
Smith & Sons (Rodley) Ltd., Thos.
THUNES MEK. VERKSTED, A. S.
Universal Dredge Mfg. Co.
Vaughan Crane Co., Ltd.
Yuba Mining Div.

TRUCK OR TRACTOR MOUNTED

Allis-Chalmers Mfg. Co., Const.
Machy, Div.
American Hoist & Derrick Co.,
American M.A.N. Corp.
Augsburg-Nurnberg AG, Mas-
chinenfabrik (M.A.N.)
BALDWIN-LIMA-HAMILTON
CORP.
BUCTRUS ERIE CO.
CLARK EQUIP. CO., CONSTRU-
TION MACH. DIV.
Clyde Iron Wks., Inc.
Clyde Mobile—see Bay City Shovels,
Inc.
Demag Aktiengesellschaft
Four Wheel Drive Auto Co., The
Garwood Industries, Inc.
HARNISCHFEGGER CORP.
HEAD-WRIGHTSON STOCKTON
FORGE LTD.
HIAE—SEE STANCO MFG. &
SALES, INC.
HYDROCRANE—SEE BUCTRUS-
ERIE CO.
Hyster Co.
INTERNATIONAL HARVESTER
EXPORT CO.
International Superior—see Inter-
national Harvester Export Co.
Koeching Co.
LE TOURNEAU-WESTINGHOUSE
ERIE CO.
Link Belt Speeder Corp.
LIMA — SEE BALDWIN-LIMA-
HAMILTON CORP.
Lorain—see Thew Shovel Co.
MANITOWOC ENG. CORP.
Mannesmann Export G.m.b.H.
MARION POWER SHOVEL CO.
Merton Engineering Co., Ltd.
Michigan—see Clark Equipment Co.
Motor-Crane—see Thew Shovel Co.
Northwest Eng. Co.
Ohio Hoist & Mfg. Co.
Pettibone Mulliken Corp.
Quick Way Truck Shovel Co.
Schild Bantam Co.
Services Supply Corp.
Smith & Sons (Rodley) Ltd., Thos.
Stenberg Corp. of Canada Ltd.
Thew Shovel Co.
Tico—see Stenberg Corp. of Canada,
Ltd.
TRANSIT CRANE — SEE
EUCYTRUS-ERIE CO.
TOURNAFUL—SEE LE TOUR-
NEAU-WESTINGHOUSE CO.
Uhrden, Inc.
Unit Crane & Shovel Corp.
Washington Iron Works

CRUSHER PARTS

(Other than primary crusher
manufacturers below)
ALLIS CHALMERS MFG. CO.,
INDUSTRIES GROUP
Alloy Steel & Metals Co.
American Brake Shoe Co., American
Manganese Steel Div.
Bohler Bros. & Co. Ltd.
COLUMBIA STEEL CASTING CO.,
INC.
Crusher Eng. Div., Poor & Co.
ELECTRIC STEEL FOUNDRY CO.
HADFIELD'S LTD.
Humboldt, Klockner-Humboldt-Deuts.
AG
Jeffrey Mfg. Co., The
Pettibone Mulliken Corp.
Taylor-Wharton Iron & Steel Co.

CRUSHERS

See also Laboratory Equipment
and Supplies; Pulverizers

CONE

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
American Brake Shoe Co., American
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Bath Iron Wks. Corp.

Coeur d'Alene Hardware & Foundry Co.
ELECTRIC STEEL FOUNDRY CO.
 Fraser & Chalmers
 General Electric Co. Ltd., The
 Humboldt, Klockner - Humboldt-Deuts. A. G.
HYDROCOKE—SEE ALLIS CHALMERS MFG. CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Klockner-Humboldt-Deuts. A. G.
 Lippmann Eng. Works
MINE & SMELTER SUPPLY CO.
 THE MARCY MILL DIV.
NORDBERG MANUFACTURING CO.
 Pegson Ltd.
 Pennsylvania Crusher Co.
 Smith Engineering Works
STURTEVANT MILL CO.
SYMONS—SEE NORDBERG MANUFACTURING CO.

DISK
ELECTRIC STEEL FOUNDRY CO.
HADFIELD LTD.

GYRATORY
ALLIS-CHALMERS MFG. CO.
INDUSTRIES GROUP
 American Brake Shoe Co., American
 Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Bath Iron Wks. Corp.
ELECTRIC STEEL FOUNDRY CO.
 General Electric Co. of England, Ltd.
HADFIELD LTD.
 Humboldt, Klockner-Humboldt-Deuts. A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Kue-ken—see Straub Mfg. Co., Inc.
 Klockner-Humboldt-Deuts. A. G.
 Lippmann Engineering Works
MASSCO—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NORDBERG MFG. CO.
 Pegson Ltd.
 Pennsylvania Crusher Co.
 Smith Engineering Works
STURTEVANT MILL CO.
SUPERIOR—SEE ALLIS CHALMERS MFG. CO.
SYMONS—SEE NORDBERG MANUFACTURING CO.
TRAYLOR ENGR. & MFG. CO.

HAMMER AND IMPACT
ALLIS-CHALMERS MFG. CO.
INDUSTRIES GROUP
 American Brake Shoe Co., American
 Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Athey Prod. Corp.
 Aveling-Barford
 Bath Iron Wks.
 Baxter, Ltd.
 Bradford-Breaker—see Penn. Crusher Co.
 British Jeffrey-Diamond Ltd.
 Combustion Engineering, Inc., Raymond Div.
 Crusher Eng. Div., Poor & Co.
 Eagle Crusher Co.
ELECTRIC STEEL FOUNDRY CO.
 Fraser & Chalmers
 General Electric Co. Ltd., The
 Gruendler Crusher & Pulverizer Co.
HAZEMAC OF GERMANY—SEE HAZEMAC USA, INC.
 Humboldt, Klockner-Humboldt-Deuts. A. G.
 International Combustion (Export) Ltd.
 Iowa Manufacturing Co.
 Jeffrey Manufacturing Co.
JOY MFG. CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Klockner-Humboldt-Deuts. A. G.
KNITTEL—SEE STEPHENS-ADAMSON MFG. CO.
 Krupp, Fried. Maschinen und Stahlfabrik Rheinhausen
 Lippmann Engineering Works
MUDHOG—SEE JEFFREY MANUFACTURING CO.
THE MARCY MILL DIV.
NORDBERG MFG. CO.
 Pegson Ltd.
 Pennsylvania Crusher Co.
 Pioneer Eng. Div., Poor & Co., Inc.
 Pettibone Mulliken Corp.
 Polysius G.m.b.H.
 Pulva Corp.
 PulvaSizers—see Pulva Corp.
PULVERIZATOR CO.—SEE ALLIS CHALMERS MFG. CO.

Rogers Iron Works Co.
 Simplicity Engineering Co.
 Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
SYMONS—SEE NORDBERG MFG. CO.
THUNES MEK. VERSTED, A. S.
 Universal Engineering Corp.
 Universal—see Pettibone Mulliken Corp.
 Williams Crusher & Pulverizer Co.
 Wolf, Buckau R (Maschinenfabrik) A.G.

JAW
A-1—SEE ALLIS CHALMERS MFG. CO.
ALLIS-CHALMERS MFG. CO.
INDUSTRIES GROUP
 Alloy Steel & Metals Co.
 American Brake Shoe Co., American
 Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Aveling-Barford
BALDWIN-LIMA-HAMILTON CORP.
 Bath Iron Wks. Corp.
 Baxter, Ltd., W. H.
 Bico, Inc.
 Birdsboro Steel Foundry & Machine Co.
 Broadbent, Robert & Son, Ltd.
 Crusher Eng. Div., Poor & Co.
DFC—SEE DENVER FIRE CLAY CO.
THE DENVER EQUIP. CO.
DENVER FIRE CLAY CO.
 Eagle Crusher Co.
ELECTRIC STEEL FOUNDRY CO.
 Farrel-Bacon—see Farrel-Birmingham Co.
 Farrel-Birmingham Co., Inc.
 Fraser & Chalmers
 General Electric Co. Ltd., The
 Gruendler Crusher & Pulverizer Co.
 Gutchoffnungshutte A.G.
HADFIELD LTD.
 Humboldt, Klockner-Humboldt-Deuts. A. G.
 Iowa Manufacturing Co.
 Jeffrey Manufacturing Co.
 Kenco
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Klockner-Humboldt-Deuts. A. G.
 Kue-ken—see Straub Mfg. Co., Inc.
 Lippmann Engineering Works
MADSEN—SEE BALDWIN-LIMA-HAMILTON CORP.
MASSCO—SEE MINE & SMELTER SUPPLY CO.
McLANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.
 Morgordshammars Mek. Verkstads A.B.
 Morse Bros. Machinery Co.
NORDBERG MFG. CO.
PACIFIC—SEE ALLOY STEEL & METALS CO.
 Parker, Ltd., Frederick
 Pegson, Ltd.
PENNSYLVANIA CRUSHER CO.
 Pettibone Mulliken Corp.
 Pioneer Engr. Div. Poor & Co., Inc.
 Reliance—see Universal Road Machinery Co.
 Rogers Iron Works Co.
 Smith Engineering Works
STURTEVANT MILL CO.
SYMONS—SEE NORDBERG MFG. CO.
 Texas Gulf Sulphur Co.
TRAYLOR ENGINEERING & MFG. CO.
 Universal—see Pettibone Mulliken Corp.
 Universal Engineering Corp.
 Universal Road Machinery Co.
 Westfalsche Maschinenbau G.m.b.H.

ROLL
 ACF Industries, Inc., American Car & Foundry Div.
ALLIS-CHALMERS MFG. CO.
INDUSTRIES GROUP
 American Brake Shoe Co., American
 Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.

AUSTIN-WESTERN (SEE BALDWIN-LIMA-HAMILTON CORP.)
 Aveling-Barford
BALDWIN-LIMA-HAMILTON CORP.
 Bath Iron Wks. Corp.
 Bonded Scale & Machine Co.
 British Jeffrey-Diamond Ltd.
 Combustion Engineering Inc.,—Raymond Div.
 Crusher Eng. Div., Poor & Co.
 Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
THE ELECTRIC STEEL FOUNDRY CO.
 Exolon Co., The
FAIRMONT—SEE ALLIS CHALMERS MFG. CO.
FLEXROLL—SEE JEFFREY MANUFACTURING CO.
 Fraser & Chalmers
 General Electric Co. Ltd., The
 Gruendler Crusher & Pulverizer Co.
 Gundlach Machine Co., T. J.
HADFIELD LTD.
 Humboldt, Klockner-Humboldt-Deuts. A. G.
 Iowa Manufacturing Co.
 International Combustion (Export) Ltd.
 Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Klockner-Humboldt-Deuts. A. G.
LINE-BELT CO.
 Lippmann Engineering Works
McLANAHAN & STONE CORP.
 McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO.
THE MARCY MILL DIV.
MORSE BROS. MACHINERY CO.
 Osborne Lab., Inc. Raymond G.
 Pegson Ltd.
 Pennsylvania Crusher Co.
 Pettibone Mulliken Corp.
 Pioneer Engr. Div., Poor & Co., Inc.
 Rogers Iron Works Co.
 Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
TRAYLOR ENGINEERING & MFG. CO.
 Union Iron Works Co.
 Universal—see Pettibone Mulliken Corp.
 Universal Engineering Corp.
 Vulcan Patent Wks. Co. (Pa.)
 Williams Patent Crusher & Pulverizer Co.
 Wilmot Eng. Co.

CYCLONES
 See also Classifiers
ALLISON STEEL MFG. CO.
 American Air Filter Co., Inc.
 Buell Eng. Co., Inc.
CENTRIFUGAL—SEE DORR-OLIVER, INC.
 Centrifugal & Mechanical Industries, Inc.
 Combustion Engineering Inc. (Raymond Div.)
DENVER EQUIPMENT CO.
DORR-OLIVER
DORRCLONES—SEE DORR-OLIVER, INC.
 Ducon Co.
 Equipment Engineers Inc.
 Fraser & Chalmers Eng. Works
 General Electric Co. of England, Ltd.
HARDINGE CO., INC.
 Heyl & Patterson, Inc.
 Humboldt, Klockner-Humboldt-Deuts. A. G.
JOHNSON MARCH CORP.
 Klockner-Humboldt-Deuts. A. G.
 Liquid & Solid Separations Ltd.
NORTHERN BLOWER CO.
 Peterson Filters & Engineering Co.
STANDARD STEEL CORP.
TELLURIDE IRON WORKS CO.
WESTERN MACHY. CO.
 Wilkinson Rubber Linatex, Ltd.
 Williams Patent Crusher & Pulverizer Co.
 Wilmot Eng. Co.

CYLINDERS AND ACTUATORS
 Commercial Shearing & Stamping Co.
 Holman Bros. Ltd.
 Loden Mfg. Co.
 McDowell Co., Inc.
 Wellman Engineering Co., The
 Westinghouse Air Brake Co., Cleveland Rock Drill Div.
 Westinghouse Air Brake Co., Inc.
 Industrial Products Div.

DIAMOND BIT RESETTNG SERVICE
ACKER DRILL CO., INC.
 American Coldset Corp.
 Anton Smit & Co. Inc.
 Crallius Company Ltd.
 Hoffman—see Stansco
JOY MFG. CO.
STANCO MFGS. & SALES, INC.
 L. M. Van Moppes & Sons, Ltd.
 Wheel Truing Tool Co.

DIAMOND DRILL EQUIPMENT
 See also BITS; DRILLS, ROCK
ACKER DRILL CO., INC.
 American Coldset Corp.
BOYLES BROS. DRILLING CO.
 Boyles Bros. Drilling Co., Ltd., (Canada)
 Core Storage Equip., see Tomco Products Co.
 Crallius Company Ltd.
DIAMOND DRILL CONTRACTING CO.
 Drilling Accessory & Mfg. Co., Ltd.
 Failing Co., George E.
 Hoffman—see Stansco
JOY MANUFACTURING CO.
LONGYEAR CO., E. J.
 Pennsylvania Drilling Co.
 Salzgitter Maschinen A. G.
SPRAGUE & HENWOOD, INC.
STANCO MFGS. & SALES, INC.
 Tomco Products Co.
 Wheel Truing Tool Co.

DIAMOND DRILLING
 See Exploration Services
DIAMOND DRILLS
 See Drills, Rock

DIAMONDS, INDUSTRIAL
 See also Diamond Bit Resetting Service
 American Coldset Corp.
 Carbology—see General Electric Co.
 Metallurgical Products Dept.
 Coldset—see American Coldset Corp.
DIAMOND TOOL RESEARCH CO., INC.
 General Electric Co., Metallurgical Products Dept.
 Havlick Diamond Drilling Co., Inc.
 Int'l. General Elec. Co.
 Koebel Diamond Tool Co.
LONGYEAR, E. J. CO.
 Smit & Co., Inc., Anton
 Smit & Sons, Inc., J. K.
 Snyder Mine & Chemical Lab.
SPRAGUE & HENWOOD, INC.
 Van Moppes & Sons, Ltd., L. M.
VAREL DIAMOND PRODUCTS CO.
 Wheel Truing Tool Co.

DIPPERS
 See Buckets
DOORS, MINE
AMERICAN MINE DOOR COMPANY
CANTON—SEE AMERICAN MINE DOOR COMPANY
 Coeur d'Alene Hardware & Foundry Co.
 Gregs Co., Ltd.
 Henschel, Hermann
 Hirsch Bros. Machy. Co.

DRAFTING SUPPLIES
 See Engineering Supplies and Drafting Equipment

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Draglines

DRAGLINES

See Excavators

DREDGES AND

DREDGE BUCKETS

CONNECTED BUCKETLINE

American Brake Shoe Co., Amer.
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
COLUMBIA STEEL CASTING CO.,
INC.
DRAVO CORP.
ELICOTT MACHINE CORP.
HADDIELDS LTD.
McDowell Co., Inc.
Morris Machine Works
Taylor-Wharton Iron & Steel Co.
Universal Dredge Mfg. Co.
Washington Iron Works
Wellman Eng. Co. Williams Bucket
Divn.
Yuba Mining Div.

CUTTERHEAD (Hydraulic)

see also Monitors

American Brake Shoe Co., American
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
American Hosiery & Derrick Co.,
Crosby-Laughlin Div.
American Steel Dredge Co., Inc.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Eagle Iron Works
ELECTRIC STEEL FOUNDRY CO.
Ellisott Machine Corporation
HACK ENG. CO.
Taylor-Wharton Iron & Steel Co.
Universal Dredge Mfg. Co.
Yuba Mining Div.

DRAGLINE DREDGE

American Brake Shoe Co., American
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
ELECTRIC STEEL FOUNDRY CO.
HACK ENG. CO.
HADDIELDS LTD.
Maddox Foundry & Machine Works
McDowell Co., Inc.
Page Engr. Co.
Taylor-Wharton Iron & Steel Co.
Universal Dredge Mfg. Co.
Washington Iron Works
Wellman Engineering Co., The
Yuba Mining Div.

DRIFTERS

See Drills, Rock

DRILLING CONTRACTORS

See Exploration Services

DRILL SHARPENERS

See Sharpeners, Rock Bit and
Steel

DRILL STEEL

See Steel

DRILLS, ROCK

See also Diamond Drill
Equipment

AUGER DRILLS

ACKER DRILL COMPANY, INC.
American Brake Shoe Co., American
Manganese Steel Div.
ATLAS COPCO AB, SWEDEN
Bohler Bros. & Co. Ltd.
Carboloy—see General Electric Co.
Metallurgical Products Dept.
Cardox Corp., Hardsong Div.
Central Mine Equipment Co.
CHICAGO PNEUMATIC TOOL CO.
Coalmaster—see Central Mine
Equipment Co.
Consolidated Pneumatic Tool Co.,
Ltd.
English Drilling Equipment Co.
Failing Co., Geo. E.
Firth Sterling, Inc.

GARDNER-DENVER CO.
General Electric Co., Metallurgical
Products Dept.
General Equipment Co.
George Moss Pty Ltd.
Hausherr, Rudolf & Son G.m.b.H.
Holman Bros. Ltd.
Kerfmakler—see Central Mine
Equipment Co.
LONGYEAR, E. J. CO.
Mayhew Supply Co.
McCarthy—see Salem Tool Co., The
Mobile Drilling, Inc.
Svenaka Motorbör AB
Rogers Iron Works Co.
Salem Tool Co., The
Thor Power Tool Co.
Vascoloy-Ramet Corp.
Werf Conrad & Stork Hljach N. V.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Wood & Co. Ltd., Hugh
Werthington Corp.

CHURN DRILLS

BUCHRUS-ERIE CO.
Crassius Company Ltd.
General Electric Co., Carboloy Dept.
Hillman Co., Inc., C. Kirk
Hosefield Mfg. Co.
LONGYEAR, E. J.
Mills Iron Works, Inc.
Mobile Drilling Inc.
Salzgitter Maschinen Aktiengesell-
schaft
SPANG & CO.

CRAWLER-MOUNTED DRILLS

Alimak-Verken AB
ATLAS COPCO—SEE ATLAS DIE-
SEL, A. B. SWEDEN
BUCHRUS-ERIE CO.
Challenger—see Joy Mfg. Co.
CHICAGO PNEUMATIC TOOL
CO.
Drilling Accessory & Mfg. Co., Inc.
Failing Co., Geo. E.
GARDNER-DENVER CO.
Holman Bros. Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Mayhew Supply Co.
Mobile Drilling Inc.
PORTA-DRILL—SEE WINTER-
WEISS CO., THE
Reich Bros. Mfg. Co.
Reichdrill Mfg. Co., Ltd.
Salem Tool Co.
Salzgitter Maschinen Aktiengesell-
schaft
Schramm Inc.
Thor Power Tool Co.
TRACDRILL—SEE JOY MFG. CO.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Ro Div.
Winter-Weiss Co., The
Wood & Co. Ltd., Hugh

DIAMOND DRILLS

ACKER DRILL COMPANY, INC.
American Coldset Corp.
Atomic Eng. Corp.
BOYLES BROS. DRILLING CO.
Boyles Bros. Drilling Co., Ltd.
(Canada)
CHICAGO PNEUMATIC TOOL
CO.
Consolidated Pneumatic Tool Co.
Crassius Company Ltd.
Damco—see Drilling Accessory &
Mfg. Co., Inc.
DIAMOND DRILL CONTRACT-
ING CO.
Drilling Accessory & Mfg. Co., Inc.
Du Jac Mfg. Co.
Failing Co., Geo. E.
General Electric Co., Carboloy Dept.
Hermann Von Rantenkrantz
Holeycat—see Atomic Eng. Corp.
Hitchcock, Leo I.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
Koeber Diamond Tool Co.
Kor-It—see Stanco
LONGYEAR CO., E. J.
Metal Carbides Corp.
Moab Drilling Co.
Mobile Drilling Inc.
Monarch Equipment Co.
Morgardshammars Mek. Verkstads
A.B.
Pennndrill—see Pennsylvania Drill-
ing Co.
Pennsylvania Drilling Co.
Port-O-Power—see Hitchcock Mfg.
Co., Leo
SPRAGUE & HENWOOD, INC.
STANCO MFGS. SALES, INC.
Super Pioneer—see Diamond Drill
Contracting Co.
TELLURIDE IRON WKS.
Tomco

Wheel Trusing Tool Co.
Wink Corp.

DOWN HOLE

Bohler Bros. & Co. Ltd.
Failing Co., George E.
Gardner-Denver Co.
Holman Bros. Ltd.
JOY MFG. CO.
Schramm Inc.
Thor Power Tool
Winter-Weiss Co., The

DRIFTERS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Bohler Bros. & Co. Ltd.
Bohler, Gebr. & Co. A.G.
CHICAGO PNEUMATIC TOOL
CO.
Consolidated Pneumatic Tool Co.,
Ltd.
Dagenhardt-Utsch K.G.
Demag Aktiengesellschaft
FLOTTMANN G.M.B.H.
GARDNER-DENVER CO.
Hauhinco Maschinenfabrik
Hausherr, Rudolf & Son G.m.b.H.
Holman Bros. Ltd. (England)
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air
Brake Co.
Schramm Inc.
SILVER STREAK—SEE JOY
MFG. CO.
Thor Power Tool Co.
Turbo Maschinen A. G.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roi Div.
Werthington Corp.

GASOLINE DRILLS AND HAMMERS

ACKER DRILL CO.
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
ATLAS COPCO, A. B. SWEDEN
Carpo Mfg. Co.
CHICAGO PNEUMATIC TOOL
CO.
Crassius Company, Ltd.
General Equipment Co.
Hosefield Manufacturing Co.
PIONJAR—SEE STANCO MFG. &
SALES, INC.
Porto Drill Co.
Powermite Drill & Tool Co.
STANCO MFG. & SALES, INC.
Svenaka Motorbör AB., Stockholm-
Soleina, Sweden
Syston Co.

JET PIERCING DRILLS

BUCHRUS-ERIE CO.
Carpo Mfg. Inc.
Linde Air Prod. Co.
Union Carbon & Carbide Corp.
Linde Air Products Co., Div.

JUMBO AND BOOM ASSEMBLIES

See also Self Loading Transport
Alimak-Verken AB
ATLAS COPCO, A. B. SWEDEN
CHICAGO PNEUMATIC TOOL
CO.
Consolidated Pneumatic Tool Co.,
Ltd.
GARDNER-DENVER CO.
Gismo—see Sanford Day Iron Wks.
Holman Bros. Ltd.
HYDRO DRILL JIB—SEE JOY
MANUFACTURING CO.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Landy Steel Co.
MAYO TUNNEL & MINE EQUIP.
CO.
Mobile Drilling Inc.
Rogers Iron Works Co.
Sanford Day Iron Wks.
Shaft & Development Machines,
Inc.
Thor Power Tool Co.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roi Div.
Winter-Weiss Co., The

ROTARY DRILLS

ACKER DRILL COMPANY, INC.
Augsburg-Nürnberg A. G., Masch-
inenfabrik (M.A.N.).
Bohler, Gebr. & Co. A.G.
BUCHRUS-ERIE CO.
Cardox Corp.
CHAMPION—SEE JOY MFG. CO.

CHICAGO PNEUMATIC TOOL CO.
Conrad-Stork
Consolidated Pneumatic Tool Co.,
Ltd.

Dagenhardt-Utsch A.G.
Damco—see Drilling Accessory Mfg.
Co., Inc.
Drilling Accessory Mfg. Co., Inc.
English Drilling Equipment Co.
Failing Co., George E.
Firth Sterling, Inc.
FLOTTMANN-WERKE G.M.B.H.
GARDNER-DENVER CO.
General Electric Co., Carboloy Dept.
Hauhinco Maschinenfabrik
Henschel, Hermann
Holman Bros. Ltd.
Failing Co., Geo. E.
Hurricane—see Mayhew Supply Co.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air
Brake Co.
LONGYEAR CO., E. J.
Mayhew Supply Co.
Moab Drilling Co.
Mobile Drilling Inc.
National Supply Co. (Pa.)
Pandril—see Pennsylvania Drill-
ing Co.
Pennsylvania Drilling Co.
PORTA-DRILL—SEE WINTER-
WEISS CO., THE
Port-O-Power—see Hitchcock Mfg.
Co., Leo.
Powermite Drill & Tool Co.
Reich Bros. Mfg. Co.
Reichdrill Mfg. Co. Ltd.
Rogers Iron Works Co.
Salzgitter Maschinen Aktiengesell-
schaft
Schramm Inc.
SPRAGUE & HENWOOD, INC.
Star Expansion Pacific, Inc.
Thor Power Tool Co.
VAREL MFG. CO.
Vascoloy-Ramet Corp.
Werf Conrad & Stork Hljach N. V.
Westinghouse Air Brake Co. (Pa.)
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Winter-Weiss Co., The

ROTARY, PERCUSSIVE

ATLAS COPCO AB
ATLAS COPCO PACIFIC, INC.
Bohler Bros. & Co. Ltd.
Failing Co., George E.
JOY MFG. CO.
Holman Bros. Ltd.
Reichdrill Mfg. Co. Ltd.
Schramm, Inc.
Winter-Weiss Co., The

SHOT DRILLS

ACKER DRILL COMPANY, INC.
Cardox Corp.
Consolidated Pneumatic Tool Co.
Crassius Company Ltd.
Damco—see Drilling Accessory &
Mfg. Co., Inc.
Drilling Accessory & Mfg. Co., Inc.
English Drilling Equipment Co.
Failing Co., George E.
GARDNER-DENVER CO.
Mayhew Supply Co.
Moab Drilling Co.
Mobile Drilling, Inc.
Pennndrill—see Pennsylvania Drill-
ing Co.
Pennsylvania Drilling Co.
Porta-Drill—see Winter-Weiss Co.,
The
Reich Bros. Mfg. Co., Inc.
Reichdrill Mfg. Co. Ltd.
Salzgitter Maschinen Aktiengesell-
schaft
SPRAGUE & HENWOOD, INC.
Westinghouse Air Brake Co. (Pa.)
Winter-Weiss Co., The

SINKERS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO PACIFIC, INC.
ATLAS COPCO PACIFIC, INC.
Bohler Bros. & Co. Ltd.
CHICAGO PNEUMATIC TOOL
CO.
Consolidated Pneumatic Tool Co.,
Ltd.
Demag Aktiengesellschaft
FLOTTMANN G.M.B.H.
GARDNER-DENVER CO.
Hausherr, Rudolf & Son G.m.b.H.
Henschel, Hermann Maschinen-
fabrik
Holman Bros. Ltd. (England)
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air
Brake Co.
Powermite Drill & Tool Co.
Schramm Inc.

Electrical Equipment

SILVER STREAK—SEE JOY MFG. CO.
SPANG & CO.
 Thor Power Tool Co.
 Turbo-Maschinen A.G.
 Westinghouse Air Brake Co., Le
 Roi Div.

STOPPERS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
 Bohler Bros. & Co. Ltd.
 Bohler, Gebr. & Co. A. G.
CHICAGO PNEUMATIC TOOL CO.
 Consolidated Pneumatic Tool Co., Ltd.
 Dagenhardt-Utsch K. G.
 Demag Aktiengesellschaft
 Firth Sterling, Inc.
FLOTTMANN G.M.B.H.
GARDNER-DENVER CO.
 Haubner Maschinenfabrik
 Hausherr, Rudolf & Son G.m.b.H.
 Holman Bros. Ltd (England)
 Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
SILVER STREAK — SEE JOY MFG. CO.
TELLURIDE IRON WKS.
 Thor Power Tool Co.
 Turbo-Maschinen A. G.
 Westinghouse Air Brake Co., Cleveland Rock Drill Div.
 Westinghouse Air Brake Co., Le
 Roi Div.

TRUCK-MOUNTED

Alimak-Verken AB
ACKER DRILL CO., INC.
 Atomic Eng. Corp.
 Blast Air—see Mfg. Co.
 Boyles Bros. Drilling Co. Ltd.
 (Canada)
Copco Mfg. Co.
 Damco—see Drilling Accessory & Carpo Mfg. Co.
 Drilling Accessory & Mfg. Co., Inc.
DRILLMASTER — SEE INGERSOLL-RAND CO.
 Failing Co., Geo. E.
 Four Wheel Drive Auto Co., The
GARDNER-DENVER CO.
 Holecat—see Atomic Eng. Corp.
INGERSOLL-RAND CO.
JOY MFG. CO.
LONGYEAR CO., E. J.
 Mayhew Supply Co.
 Mobile Drilling Inc.
 National Supply Co. (Pa.)
 Porta-Drill—see Winter-Weiss Co., The
 Powermate Drill & Tool Co.
 Reich Bros. Mfg. Co.
 Reichdrill Mfg. Co., Ltd.
 Salgitter Maschinen Aktiengesellschaft
 Schramm, Inc.
SPRAGUE & HENWOOD, INC.
STANCO MFG. & SALES CO.
 Werf Conrad Hiesch Stork N. V.
 Westinghouse Air Brake Co., Le
 Roi Div.
 Westinghouse Air Brake Co. (Pa.)
 Winter-Weiss Co., The

WAGON DRILLS

Alimak-Verken AB
ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
 Consolidated Pneumatic Tool Co., Ltd.
DEMAG AKTIENGESellschaft
 Drilling Accessory & Mfg. Co., Inc.
 Firth Sterling, Inc.
GARDNER-DENVER CO.
 Haucherr, Rudolf & Son G.m.b.H.
 Holman Bros Ltd (England)
 Holman Bros. (Canada) Ltd.
HOSSFELD MANUFACTURING CO.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
 Junction Bit & Tool Co.—
 Le Roi Div. Westinghouse Air Brake Co.
 Salgitter Maschinen Aktiengesellschaft
 Schramm, Inc.
 Thor Power Tool Co.
 Westinghouse Air Brake Co., Le Roi
 Div.
 Worthington Corp.

DRIVES

See Also Shaft-Mounted Drives,
 Gears; Open Gearing

CHAIN

American Brake Shoe Co., American
Manganese Steel Div.
 Bonded Scale & Machine Co.
 Chain Belt Co.
 Dodge Mfg. Corp.
 B. F. Goodrich Co., Industrial Prod.
 Hirsch Bros. Machy. Co.
 Ideal—see National Supply Co., (Pa.)
 Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CO.
LINK-BELT CO.
 Morse Chain Co.
NATIONAL IRON CO.
 National Supply Co. (Pa.)
 Rex—see Chain Belt Co.
 Taper-Lock—see Dodge Mfg. Corp.
 Thiele, August G.m.b.H.
 Yuba Mining Co.

FLATBELT

American Rubber Mfg. Co.
 Continental Gin Co.
 Gates Rubber Co., The
HAZEMAG OF GERMANY
 Hirsch Bros. Machy. Co.
INTERNATIONAL B. F. GOOD-RICH
 Link-Belt Co.
NATIONAL IRON CO.
 National Supply Co. (Pa.)
 Quaker Pioneer Rubber Mills
 U. S. Rubber Co.
 U. S. Rubber Intl.
 Western Gear Wks.
 Yuba Mining Co.

V-BELT

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 Bonded Scale & Machine Co.
 Continental Gin Co.
 Dodge Mfg. Co.
 Gates Rubber Co., The
 Goodrich Co., B. F., Industrial Prod.
 Div.
HAZEMAG OF GERMANY
 Hirsch Bros. Machy. Co.
INTERNATIONAL B. F. GOOD-RICH
KENNEDY-VAN SAUN MFG. & ENG. CO.
LINK-BELT CO.
 MAGIC GRIP—SEE ALLIS-CHALMERS MFG. CO.
NATIONAL IRON CO.
 National Supply Co. (Pa.)
 Quaker Pioneer Rubber Mills
 Reeves Pulley Co.
 Taper-Lock—see Dodge Mfg. Co.
TEXROPE—SEE ALLIS-CHALMERS MFG. CO.
 U. S. Rubber Co.
 U. S. Rubber Intl.
 Western Gear Wks.
 Worthington Corp.
 Yuba Mining Co.

DRIVES, GEAR

See Gears

DRYERS AND KILNS

See also Sintering Machines;
 Coolers

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 American Locomotive Co.
BARBER-GREENE CO.
 Bethlehem Steel Co.
 Bird Machine Co.
 Booth Co., Inc., The
 Booth Concentrate Dryer—see Booth Co., Inc., The
 Carpo Mfg. Inc.
 Carrier Conveyor Corp.
 Centrifugal & Mechanical Industries, Inc.
 Christian Engineers, J. D.
 Combustion Engineering Inc., Raymond Div.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO., THE
DORR-OLIVER, INC.
DRAVO CORP.

ELECTRIC STEEL FOUNDRY CO.
 General American Transportation Corp.

General Machinery Co.
GOULD & CO. GORDON I. HACK ENGINEERING CO.
 Hartweg, Walter
HARDINGE CO., INC.
HAZEMAG OF GERMANY—SEE HAZEMAG USA, INC.
 Hevi-Duty Electric Co.
 Hayl & Patterson, Inc.
 Hold-Flite—see Christian Engineers, J. D.
HOLD-FLITE — SEE WESTERN PRECIPITATION CORP.
 Humboldt, Klockner - Humboldt-Deuts, A. G.
INFILCO, INC.
 Iowa Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Klockner-Humboldt-Deuts, A. G.
LINK-BELT CO.
 Loeche, Germany
MCLANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.
 Nichols Engineering & Research Corp.
NORDBERG MFG. CO.
PACIFIC FOUNDRY CO., LTD.
 Parry Dryer—see Silver Engineering Co.
 Pollock Co., The William B.
 Polysius G.m.b.H.
 Silver Engineering Co.
SKINNER—SEE MINE & SMELTER SUPPLY CO.
SMITH & CO., F. L.
STANDARD STEEL CORP.
STEARNS-ROGER MFG. CO.
 Surface Combustion Corp.
TELLURIDE IRON WKS.
TRAYLOR ENG. & MFG. CO.
 Universal Drives Mfg. Co.
VULCAN IRON WORKS, PA.
 Washington Machinery Co.
WESTERN PRECIPITATION CORP.
 Yuba Mining Div., Yuba Consolidated Industries, Inc.

DUMPERS, MINE CAR

W. G. Allen & Sons (Tipton) Ltd
ALLISON STEEL MFG. CO.
ATLAS COPCO AB, SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
CARD IRON WORKS CO., THE C. S.
 Coeur d'Arles Hardware & Foundry Co.
 Connellsville Mfg. & Mine Supply Co.
 Differential Steel Car Co.
 Koeber, Leo
GETMAN BROS. MFG. DIVEN, INC.
 Gregg Co., Ltd., The
 Hayl & Patterson, Inc.
 Carl Kaebler
KAR-FLO—SEE LINK-BELT CO.
 Koebering Co.
LAKE SHORE INC.
LINK-BELT CO.
 McDowell Co., Inc.
 McNally Pittsburgh Co.
MINERS FOUNDRY & MFG. CO.
 Nolan Co., The
 Pacific Car & Foundry Co.
 Pohlig, J., A.G.
 Rogers Iron Wks.
TELLURIDE IRON WORKS
UNITED STATES STEEL EXPORT CO.
 Wellman Engineering Co.

DUST COLLECTION

EQUIPMENT

Aeroturn—see Koppers Co. Inc.
 Metal Prod. Div.
 American Air Filter Co.
 American Blower Div. of American Standard
BARBER-GREENE CO.
 Buell Engineering Co., Inc.
 Combustion Engineering Inc., Raymond Div.

Consolidated Pneumatic Tool Co., Ltd.
 Convaire, Inc.
COTTRELL — SEE WESTERN PRECIPITATION CORP.
DUALAIR — SEE WESTERN PRECIPITATION CORP.

Ducon Co.
 Dustube—see Wheelabrator Corp.
 Failing Co., George E.
 Fraser & Chalmers
General Electric Co. Ltd., The
HAZEMAG OF GERMANY—SEE HAZEMAG USA, INC.
 Humboldt, Klockner - Humboldt-Deuts, A. G.
 Iowa Manufacturing Co.
 Jonson March Corp.
JOY MFG. CO.
 Klockner-Humboldt-Deuts, A. G.
 Koppers Co. Inc., Metal Prod. Div.
 Markely Dust Control System, Inc.
 Martindale Electric Co.
 Microdyne—see Joy Mfg. Co.
 Mine Safety Appliances Co.
MINICLON — SEE WESTERN PRECIPITATION CORP.
NATIONAL FILTER MEDIA CORP.
NORBLU — SEE NORTHERN BLOWER CO., THE
NORTHERN BLOWER CO., THE
 Research Cottrell, Inc.
 Sly Mfg. Co., The W. W.
 Spencer Turbine Co., The
 Standard Filterbau G.m.b.H.
 Standard Steel Corp.
STURTEVANT MILL CO.
 The Power Tool Co.
Torlt Manufacturing Co.
 Hayward Tyler & Co.
 The Vaseo Engr. Co.
 U. S. Hoffmann Machinery Corp.
WESTERN PRECIPITATION CORP.
 Westinghouse Air Brake Co., Cleveland Rock Drill Div.
 Westinghouse Air Brake Co., Le
 Roi Div.
 Westinghouse Electric Corp.
 Wheelabrator Corp.

ELECTRICAL EQUIPMENT

See also Magnetic Equipment;
 Locomotives; Batteries;
 Chargers; Welding Equipment;
 Supplies and Services; Hoisting
 Equipment; Communications;
 Winches; Cable and Conduit

CABLE AND CONDUIT

See Cable and Conduit

INSTRUMENTS

See Controls; Recorders

LIGHT PLANTS

ACEC
 A. E. C. Limited
 Allis-Chalmers Mfg. Co., Buda
 Engine-Material Handling Equip.
 American M.A.R.C.
 American Locomotive Co.
 Caterpillar Tractor Co.
 Cummins Engine Co., Inc.
 Dorman & Co., Ltd., W. H.
 Fairbanks, Morse & Co.
 General Electric Co., Apparatus
 Sales Div.
 General Electric Co. of England,
 Ltd.
GM DIESEL—SEE GENERAL MOTORS OVERSEAS OPERATIONS
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
HARNISCHFEGGER CORP.
 Hobart Bros. Co.
 Hobart—see Motor Generator Corp.
 Homelite Corp.
 Ideal Electric & Mfg. Co.
 International Gen'l Elec. Co.
JOY-LITE—SEE JOY MFG. CO.
JOY MANUFACTURING CO.
 Kohler Co.
 Lister-Blackstone, Inc.
 Lynco Powerhouse—see Lynn
 Engr. & Supply Co.
 Minneapolis-Moline Co.
 Motor Generator Corp.
NORDBERG MFG. CO.
 Onan & Sons, Inc., D. W.
 Power-Lite—see Lynn Eng. Co.
 Ready Power Co.
 Schoonmaker Co., Inc., F. G.
 Sheppard Co., R. H.
STEARNS-ROGER MFG. CO.
 Thor Power Tool Co.
 Westinghouse Electric Corp.
 White Motor Co., Diesel Engine Div.
 Witte Engine Works, Oil Well
 Supply Div.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Switches

MOTORS, GENERATORS, AND CONVERTERS

ACEC
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ASEA ELECTRIC, INC.
ASEA, SWEDEN
 Brown Boveri & Cie. A.G.
 Caterpillar Tractor Co.
 Connecticut Telephone & Electric Corp.
DELCO—SEE GENERAL MOTORS OVERSEAS OPERATIONS
 Eaton Manufacturing Co.
 Electric Machinery Mfg. Co.
 Fairbanks, Morse & Co.
 General Dynamics Corp., Electro Dynamic Div.
 General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
 General Electric Co. of England, Ltd.
 General Motors Corp., Delco Products Div.
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
HARNISCHFEGGER CORP.
 Homelite Div. Textron, Inc.
 Howell Electric Motors Co.
 Ideal Electric & Mfg. Co.
 Int'l General Elec. Co.
 Carl Kaebler
 Kato Engineering Co.
 Lancashire Dynamo & Crypto Ltd.
 Lima Electric Motor Co.
 The Lincoln Electric Co.
 Zinc-weld—see Lincoln Elec. Co.
 Linde Air Products Co.
 Live Roller Mills Mfg.
 Master Electric Co., The
 Mather & Plattner Ltd.
 Metropolitan-Vickers Electrical Co., Ltd.
 Miehle-Goss-Dexter, Inc., Star-Kimble Motor Div.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 R & M—see Robbins & Myers, Inc.
 Reliance Electric Engineering Co.
 Robbins & Myers, Inc.
 Schoonmaker Co., Inc., P. G.
 Sheppard Co., Inc., The R. H.
 Siemens & Halske A.G.
 Sterling Electric Motors, Inc.
 Synnergator—see U.S. Electrical Motors, Inc.
 Syntrol Co.
 Thor Power Tool Co.
 Tri-Clad—see International General Electric Co.
 Unilever—see U.S. Electrical Motors, Inc.
 U.S. Electrical Motors, Inc.
 Varidrive—see U.S. Electrical Motors, Inc.
 Wagner Electric Corp.
 Waukesha Motor Co.
 Welco—see Wesche Electric Co.
 Wesche Electric Co.
 Westinghouse Air Brake Co., Le Roi Div.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
 Westinghouse Electric Corp.
 White Motor Co.
 Worthington Corp.

PACKAGE SUBSTATION

ACEC
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 General Electric Co., Apparatus Sales Div.
 General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
INTERNATIONAL GENERAL ELECTRIC CO.
 I-T-E Circuit Breaker Co.
 Kuhlman Electric Co.
 Leonard Electric Co.
 National Supply Co. (Pa.)
 Schoonmaker Co., Inc., P. G.
 Standard Transformer Co., The
 Westinghouse Electric Corp.

SWITCHES

Micro Switch Div. of Mpls. Honeywell
TRANSFORMERS AND RECTIFIERS

ACEC
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ASEA ELECTRIC, INC.
ASEA, SWEDEN
 Carpeo Mfg., Inc.
 John Davis & Son, Ltd.
 Essex Wire Corp., Parankite Wire and Cable Div.
 General Electric Co., Apparatus Sales Div.

GENERAL ELECTRIC CO., INTERNATIONAL
GRAYBAR ELECTRIC CO., INC.
 Heri-Duty Electrical Co.
 Hillman Co., Inc., C. Kirk
INTERNATIONAL GENERAL ELECTRIC CO.
 I-T-E Circuit Breaker Co.
 Johnson & Phillips, Ltd.
 Kuhlman Electric Co.
 Reliance Electric & Engineering Co.
 Schoonmaker Co., Inc., P. G.
 Standard Transformer Co.
 Syntrol Co.
 Wagner Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
 Westinghouse Electric Corp.
 Weston Electrical Instrument Corp.
MISCELLANEOUS (CONDENSERS, RESISTORS, POTENTIOMETERS, ETC.)

ACEC
ASEA, SWEDEN
 British Insulated Callender's Cables Ltd.
 Eaton Mfg. Co., Dynamatic Div.
 EC&M Frequency Relay Control—see Electric Controller & Mfg. Co.
 The EC&M Valmitor—see Electric Controller & Mfg. Co.
 The Electric Controller & Mfg. Co.
 General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
 Graphite Metallizing Corp.
GRAYBAR ELECTRIC CO., INC.
 Hillman Co., Inc., C. Kirk
 Ideal Industries, Inc.
INTERNATIONAL GENERAL ELECTRIC CO.
 International Geophysics, Inc.
 Johnson & Phillips, Ltd.
JOY MANUFACTURING CO.
 Martindale Electric Co.
 Metropolitan-Vickers Electrical Co., Ltd.
 Micro-Switch Div. of Minneapolis-Honeywell Regulator Co.
 Minneapolis-Honeywell Regulator Co., Indus. Div.
 National Mine Service Co.
 Ohio Carbon Co., The
 Ohiohm—see Ohio Carbon Co., The
 Rawson Electrical Instrument Co.
REGULATORS—SEE ALLIS-CHALMERS MFG. CO.
 Rowan Controller Co.
RUPTAIR—SEE ALLIS-CHALMERS MFG. CO.
 Siemens & Halske A.G.
 Signal Engr. & Mfg. Co.
 Superior Carbon Prod., Inc.
 Trombetta Solenoid Corp.
 Ward Leonard Electric Co.
 Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
 Weston Electrical Instrument Corp.

ENGINE EXHAUST

CONDITIONERS,

UNDERGROUND

Hunslet Engine Co. Ltd., The
 North British Locomotive Co.
 OCM Catalytic Exhaust, OCM Diesel Exhaust, OXY-Muffler Exhaust—see Oxy-Catalyst, Inc.
 Oxy-Catalyst, Inc.
 Ruth Co., The

ENGINEERING SERVICES

See Plant Design and Construction; Exploration Services; Consulting Mining Engineers; Consulting Metallurgical Engineers

ENGINEERING SUPPLIES

& DRAFTING EQUIPMENT

See also Surveying Instruments
 Baush & Lomb Optical Co.
 Berger & Sons, Inc.
 Booklime, Inc.
 Dietzgen Co., Eugene
 General Aniline & Film Corp.
 Gaid & Div.
 Geo-Optics Co., Inc.
 Humboldt, Klockner-Humboldt-Deutz AG
 Keuffel & Esser Co.
 Lufkin Rule Co.
 Pack Mfg. Co.
 Post Co., Frederick
 Rocky Mountain Instrument Co.

White Instrument Co., David
 WILD, HERBRUGG INSTRUMENTS, INC.

ENGINES

See also Electrical Equipment

DIESEL AND SEMI-DIESEL

A. E. C. Limited
 Alco Products, Inc.
ALLIS-CHALMERS MFG. CO., CONST. MACH. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 Allis-Chalmers Mfg. Co., Engine-Material Handling Equip., The
 American Locomotive Co.
 American M.A.N. Corp.
 Baldwin-Lima-Hamilton Corp., Ed-dystone Div.
 Bellini & Marconi, Ltd.
 Caterpillar Tractor Co.
 Crossley Bros. Ltd.
CHICAGO PNEUMATIC TOOL CO.

Continental Motors Corp.
 Cooper-Bessemer Corp., The
 Cummins Engine Co., Inc.
CURTIS-WRIGHT CORP.
 Diesel Energy Corp., Klockner-Humboldt-Deutz A. G.
 Dorman & Co. Ltd., W. H.
 Fairbanks, Morse & Co.
 General Motors Corp., Detroit Diesel Engine Division
 General Motors Corp., Electro-motive Div.
GENERAL MOTORS OVERSEAS OPERATIONS
 Hall-Scott Motors, Inc.
HARNISCHFEGGER CORP.
 Hercules Motors Corp.
 Humboldt, Klockner-Humboldt-Deutz AG

INGERSOLL-RAND CO.
INTERNATIONAL HARVESTER CO.
 International Harvester Export Co.
 Carl Kaebler
 Klockner-Humboldt-Deutz, A. G.
 Lister-Blackstone, Inc.
 Mannesmann Export G.m.b.H.
 Minneapolis-Moline Co.
MIRRELES, BICKERTON & DAY, LTD.

NORDBERG MFG. CO.
 Onan & Sons, Inc., D.W.
 P & H—SEE HARNISCHFEGGER CORP.
 Roder-Blackburn Intl. Corp.
 Ruston & Hornsby Ltd.
 Schoonmaker Co., Inc., P. G.
 Sheppard Co., R. H.
 Waukesha Motor Co.

WHITE MOTOR CO., THE
 Witte Eng. Wks., Oil Well Supply Div.
 U. S. STEEL CO.
 Worthington Corp.

GAS

Allis-Chalmers Mfg. Co., Const., Mach. Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 Allis-Chalmers Mfg. Co., Engine-Material Handling Equip.
 American M.A.N. Corp.
 Caterpillar Tractor Co.
CHICAGO PNEUMATIC TOOL CO.
 Continental Motor Corp.
 Cooper-Bessemer Corp.
 Crossley Bros., Ltd.
 Cummins Engine Co., Inc.
 Fairbanks, Morse & Co.
 Hall-Scott Motors, Inc.
 Hercules Motors Corp.
 Humboldt, Klockner-Humboldt-Deutz AG

INGERSOLL-RAND CO.
INTERNATIONAL HARVESTER CO.

International Harvester Export Co.
 Klockner-Humboldt-Deutz, A. G.
 Kohler Co.
 Minneapolis-Moline Co.
 Mirreles, Bickerton & Day, Ltd.
NORDBERG MFG. CO.
 Onan & Sons, Inc., D. W.
 Waukesha Motor Co.
 Westinghouse Air Brake Co., Le Roi Div.
 Westinghouse Air Brake Co. (Pa.)
 White Motor Co., The
 Wisconsin Motor Corp.
 Witte Eng. Wks., Oil Well Supply
 U. S. STEEL CORP.
 Waukesha Motor Co.
 Worthington Corp.

GASOLINE

Allis-Chalmers Mfg. Co., Const. Mach. Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

Allis-Chalmers Mfg. Co., Engine-Material Handling Equip.
 Div.

Briggs & Stratton Corp.
 Continental Motors Corp.
 Fairbanks, Morse & Co.
 G. M. C., Allison Div.
GENERAL MOTORS OVERSEAS OPERATIONS

Hall-Scott Motors, Inc.
 Hercules Motors Corp.
 Humboldt, Klockner-Humboldt-Deutz AG
INTERNATIONAL HARVESTER CO.
 International Harvester Export Co.
 Kohler Co.
 Le Roi Div., Westinghouse Air Brake Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 Minneapolis-Moline Co.
 National Supply Co., The, Engine Div.
 Onan & Sons, Inc., D. W.
 Ruston & Hornsby Ltd.
 Turbo Jet—see G. M. C., Allison Div.
 Turbo Prop—see G. M. C., Allison Div.
 Waukesha Motor Co.
 Westinghouse Air Brake Co., Le Roi Div.
 Westinghouse Air Brake Co. (Pa.)
 White Motor Company, Diesel Engine Div.
 Wisconsin Motor Corp.
 Witte Engine Works, Oil Well Supply Div., U. S. Steel Corp.

EXCAVATORS

See also Tractors and Attachments; Dredges and Dredge Buckets; Loaders; Monitors; Scrapers

BACKHOES

Allis-Chalmers Mfg. Co., Construction Equipment Division
 American—see Amer. Hoist & Derrick Co.
 American Brake Shoe Co.
 American Hoist & Derrick Co.
BALDWIN-LIMA-HAMILTON CORP.
 Bantam—see Schield Bantam Co.
 Brown Corp. (Sales) Ltd., David
BUCHSUS-ERIE CO.
CLARE EQUIP. CO., CONSTRUCTION MACH. DIV.
ELECTRIC STEEL FOUNDRY CO.
FASTBACK—SEE ELECTRIC STEEL FOUNDRY CO.
 Gar Wood Industries, Inc.
HARNISCHFEGGER CORP.
 Hough Co., Frank G.
 Hyattaway—see Hyster Co.
 Hyster Co.
 Koehring Co.

LIMA—SEE BALDWIN-LIMA-HAMILTON CORP.
 Link Belt Speeder Corp.
 Lorain—see Thew Shovel Co.
MANITOWOC ENGR. CO.
MARION POWER SHOVEL CO.
 Northwest Eng. Co.
 Pence & Co., Inc., Earl H.
 Pettibone Mulliken Corp.
 Quick-Way Truck Shovel Co.
 Schield Bantam Co.
 Schramm, Inc.
 Smith & Sons (Rodley) Thos.
 Thew Shovel Co.
 Tractohoe—see Tractomotive Corp.
 Tractomotive Corp.
 Unit Crane & Shovel Corp.
 Westinghouse Air Brake Co., Le Roi Div.
 "Bucket Wheel Excavators"
 Fried Krupp

BUCKET CHAIN

Orenstein-Koppel and Lubecker Maschinenbau A.G.

BUCKET WHEEL

ORENSTEIN-KOPPEL UND LUBECKER MASCHINENBAU A.G.

CABLEWAYS

Stichtline

British Ropeway Engineering Co., Ltd.
CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
 Fraser & Chalmers Eng. Wks.
SAUTERMAN BROS. INC.
 Washington Iron Works

Exploration Services

Tastline
CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
Fraser & Chalmers Eng. Wks.
SAUERMAN BROS., INC.
Washington Iron Works

DRAGLINES

Diesel

American—see Amer. Hoist & Derrick Co.
American Hoist & Derrick Co.
BALDWIN-LIMA-HAMILTON CORP.
Bantam—see Schield Bantam Co.
BUCYRUS-ERIE CO.
CLARK EQUIP. CO., CONST. MACH. DIV.
Demag Aktiengesellschaft
Fa. Ten Pas & Co.
Fraser & Chalmers Eng. Wks.
Gar Wood Industries, Inc.
HARNISCHFEGGER CORP.
Koehring Co.
LIMA—SEE BALDWIN-LIMA-HAMILTON CORP.
Link Belt Speeder Corp.
LORAIN—SEE THEW SHOVEL CO.
MANITOWOC ENG. CO.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Page Eng. Co.
Quick Way Truck Shovel Co.
Ransomes & Rapier Ltd.
Schield Bantam Co.
The Shovel Co.
Unit Crane & Shovel Corp.
Washington Iron Works

Electric

American Hoist & Derrick Co.
Crosby-Laughlin Div.
Bantam—see Schield Bantam Co.
BUCYRUS-ERIE CO.
Demag Aktiengesellschaft
Fraser & Chalmers Eng. Wks.
HARNISCHFEGGER CORP.
Koehring Co.
Link Belt Speeder Corp.
MANITOWOC ENG. CO.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Page Eng. Co.
Ransomes & Rapier Ltd.
Schield Bantam Co.
The Shovel Co.
Unit Crane & Shovel Corp.

SCRAPERS, SELF-PROPELLED

Allis-Chalmers Manufacturing Co., Const. Machy. Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
BALDWIN - LIMA - HAMILTON CORP.
Beaumont—see Internl Combustion (Export) Ltd.
CW—SEE CURTISS-WRIGHT CORP., SOUTH BEND DIV.
Caterpillar Tractor Co.
CARRYALL—SEE LETOURNEAU-WESTINGHOUSE CO.
CLARK EQUIPMENT CO., CONST. MACH. DIV.
CURTISS-WRIGHT CORP., SOUTH BEND DIV.
GENERAL MOTORS CORP., EUCLID DIVISION
GENERAL MOTORS OVERSEAS OPERATIONS
Gismo—see Sanford Day Iron Works, Inc.
Gottwald, Leo
International Combustion (Export) Ltd.
INTERNATIONAL HARVESTER CO.
Landis Steel Co.
LETOURNEAU-WESTINGHOUSE CO.
Link Belt Speeder Corp.
Michiran—see Clark Equipment Co.
M-R-S Manufacturing Co.
Rogers Iron Works Co.
Sanford Day Iron Wks.
TOURNAPULL—SEE LE TOURNEAU-WESTINGHOUSE CO.
Westinghouse Air Brake Co. (Pa.)
WESTINGHOUSE CO., LE TOURNEAU

SHAFT MUCKERS—see Shaft

Sinking

SHOVELS, POWER

Diesel

American—see Amer. Hoist & Derrick Co.
American Hoist & Derrick Co.

BALDWIN-LIMA-HAMILTON CORP.-LIMA-HAMILTON DIV.

Bantam—see Schield Bantam Co.
BUCYRUS-ERIE CO.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONST. MACH. DIV.
CLARK EQUIPMENT CO.
Clyde Iron Works, Inc.
Demag Aktiengesellschaft
Elmco Corp., The
ELECTRIC STEEL FOUNDRY CO.
Gar Wood Industries, Inc.
HARNISCHFEGGER CORP.
Koehring Co.
LIMA—SEE BALDWIN-LIMA-HAMILTON CORP.
Link-Belt Speeder Corp.
Lorain—see Thew Shovel Co.
MANITOWOC ENGINEERING CORP.
MARION POWER SHOVEL CO.
MICHIGAN—SEE CLARK EQUIPMENT CO.
Newton Chambers & Co., Ltd.
Northwest Engineering Co.
P & H—SEE HARNISCHFEGGER CORP.
Quick-Way Truck Shovel Co.
RUSTON-BUCYRUS LTD.
Schield Bantam Co.
Smith & Sons (Rodley) Ltd., Thos.
The Shovel Co.
Traxacator—see Caterpillar Tractor Co.
Unit Crane & Shovel Corp.
WEISSHUTTE OTTO WOLFF G.M.B.H.

Electric

American Hoist & Derrick Co., Crosby-Laughlin Div.
Bantam—see Schield Bantam Co.
BUCYRUS-ERIE CO.
Demag Aktiengesellschaft
ELMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
Goodman Mfg. Co.
HARNISCHFEGGER CORP.
Koehring Co.
Link-Belt Speeder Corp.
Lorain—see Thew Shovel Co.
MANITOWOC ENGINEERING CORP.
MARION POWER SHOVEL CO.
Northwest Engineering Co.
P & H—SEE HARNISCHFEGGER CORP.
Salzgitter Maschinen Aktiengesellschaft
Schield Bantam Co.
The Shovel Co.
Unit Crane & Shovel Corp.

PARTS AND ATTACHMENTS

ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO.
AMEL MANGANESE STEEL DIV.
American Hoist & Derrick Co., AMSCO—SEE AMERICAN BRAKE SHOE CO.
BALDWIN-LIMA-HAMILTON CORP.
BUCYRUS-ERIE CO.
Caterpillar Tractor Co.
CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
COLORADO FUEL & IRON CORP.
COLUMBIA STEEL CASTING CO.
CURTISS-WRIGHT CORP., SOUTH BEND DIV.
Dolmar Maschinen Fabrik
ELMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
Gar Wood Industries, Inc.
General Motors Corp., Euclid Div.
HADFIELD LTD.
HARNISCHFEGGER CORP.
Koehring Co.
Link-Belt Speeder Corp.
MANITOWOC ENGINEERING CORP.
MARION POWER SHOVEL CO.
M-R-S Manufacturing Co.
Owen Bucket Co.
PACIFIC—SEE ALLOY STEEL & METALS CO.
Page Engineering Co.
Pettibone Mulliken Corp.
Quick-Way Truck Shovel Co.

R-Mer—see Vulcan Foundry Co.
Smith & Sons (Rodley) Ltd., Thos.
Taylor Wharton Iron & Steel Co.
Thew Shovel Co.
August Thiele G.m.b.H.
Unit Crane & Shovel Corp.
Vulcan Foundry Co.
WEISSHUTTE OTTO WOLFF G.M.B.H.
Westinghouse Air Brake Co., Ind. Products Div.
Westinghouse Air Brake Co., Le Roi Div.

EXPLORATION

EQUIPMENT

See also Drills, Rock

Geochemical Equipment

Analytical Measurements, Inc.
International Geophysics, Inc.
Menlo Research Lab.
Mobile Drilling, Inc.
Research Inc.

Geophysical Equipment

Analytical Measurements, Inc.
Akania-Werke A.G.
Crallius Company Ltd.
Eberline Inst. Div.—Reynolds Elect. & Eng. Co.
Elect. Technical Labs.
Engineers Syndicate, Ltd.
Falling Co., George E.
Fisher Research Laboratory
Geodynamics, Inc.
Geo-Optic Co., Inc.
Geophysical Specialties Co.
Hyeon Aerial Surveys, Inc.
International Geophysics, Inc.
JOY MFG. CO.
La Roe Instruments, Inc.
LONGYEAR CO., E. J.
M-Scope—see Fisher Research Laboratory, Inc.
Menlo Research Lab.
Minerlight—see Ultra-Violet Products, Inc.
Mobile Drilling, Inc.
Nucleonic Corp. of America
Precision Radiation Instruments, Inc.
Radisc Co., Inc., The
Rayson Electrical Instrument Co.
Research Inc.
Salem Tool Co.
Texas Instruments, Inc., Industrial Instrumentation Div. (Houston)
ULTRA-VIOLET PRODUCTS, INC.
United Geophysical Corp.
Univ. Transistor Prod. Corp.
Varian Associates
Werf Conrad & Stork Hjjach N. V.
Westinghouse Electric Corp.
Whites' Electronics
Winter-Weiss Co., The

EXPLORATION SERVICES

Aircraft

Aero Service Corp.
African Surveys (Proprietary Ltd.)
Austair, Ltd.
Bell Helicopter Co.
Canadian Aero Service Ltd.
Engineers Syndicate, Ltd.
International Geophysics, Inc.
Rick Helicopters
Urinco-Grand Junction Uranium Instruments Co.
Western Exploration Co.
World Wide Aerial Surveys (Aust.) Pty. Ltd.

DRILLING

Churn

Crallius Co. Ltd.
DIAMOND DRILL CONTRACTING CO.
Heinrichs Geoexploration Co.
International Geophysics, Inc.
JOY MFG. CO.
Koebel Diamond Tool Co.
LONGYEAR CO., E. J.

McDonald, T. J.
Moab Drilling Co.
Pennsylvania Drilling Co.
Salzgitter Maschinen Aktiengesellschaft
Shamrock Well Drilling Enterprises, Inc.
SPANG & CO.
SPRAGUE & HENWOOD, INC.
Western Exploration Co.
World Mining Consultants, Inc.
Yuba Manufacturing Co.

Diamond

BOYLES BROS. DRILLING CO.
Boyles Bros. Drilling Co. Ltd. (Canada)
Crallius Co. Ltd.
DIAMOND DRILL CONTRACTING CO.
Du Jac Mfg. Corp.
Havlicek, J. L.
Hitchcock Mfg. Co., Leo
International Geophysics, Inc.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
Koebel Diamond Tool Co.
Livingston & Wilson Exploration & Drilling Co.
LONGYEAR CO., E. J.
McDonald, T. J. (Colo.)
McDonald, T. J., (Mich.)
Moab Drilling Co.
Mobile Drilling, Inc.
Pennsylvania Drilling Co.
Shamrock Drilling Enterprises
Smit & Co., Inc., Anton
SPRAGUE & HENWOOD, INC.
St. Clair, John Q.
United Geophysical Corp.
Western Exploration Co.
World Mining Consultants, Inc.

Rotary

Boyles Bros. Drilling Co. Ltd., (Canada)
Cardox Corp.
Carpo Mfg., Inc.
Demag Aktiengesellschaft
Geodynamics, Inc.
International Geophysics, Inc.
JOY MANUFACTURING CO.
LONGYEAR CO., E. J.
Mobile Drilling, Inc.
Pennsylvania Drilling Co.
Reich Bros. Mfg. Co.
St. Clair, John Q.
Salzgitter Maschinen Aktiengesellschaft
United Geophysical Corp.
Western Exploration Co.
World Mining Consultants, Inc.

SURVEYING

Aerial

Abrams Aerial Survey Corp.
Aero Service Corp.
African Surveys (Proprietary Ltd.)
Airborne Geophysics Ltd.
Canadian Aero Service Ltd.
Chapman and Wood
Crallius Co. Ltd.
Elliott, D. H.
FAIRCHILD AERIAL SURVEYS, INC.
Geodynamics, Inc.
Geo-Optic Co., Inc.
Heinrichs Geoexploration Co.
Hunting Technical Services, Inc.
Hyeon Aerial Surveys, Inc.
International Geophysics, Inc.
LONGYEAR CO., E. J.
Lundberg Explorations, Ltd.
Menlo Research Lab.
Permo Exploration Co.
Precision Radiation Instruments, Inc.
Radisc Company, Inc., The
Research, Inc.
Sloan & Associates, Inc.
St. Clair, John Q.
STILL & STILL
Tracerlabs, Inc.
Western Exploration Co.
World Wide Aerial Surveys (Aust.) Pty. Ltd.

Geochemical

Hunting Airborne Geophysics Ltd.
Hunting Technical Services, Inc.
Heinrichs Geoexploration Co.
Geodynamics, Inc.
International Geophysics, Inc.
LONGYEAR CO., E. J.
Menlo Research Lab.
Nucleonic Corp. of America
Ore Research & Laboratories
Radisc Company, Inc., The
Research, Inc.
STILL & STILL
Western Exploration Co.
WISSER & COX

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Explosives

Geological

Abrams Aerial Survey Corp.
Aero Service Corp.
African Surveys (Proprietary Ltd.)
BOYLES BROS. DRILLING CO.
Canadian Aero Service Ltd.
CHAPMAN WOOD, AND GRIS-
WOLD
Crallius Co. Ltd.
Davis & Davis
Engineers Syndicate Ltd.
FAIRCHILD AERIAL SURVEYS,
INC.
Fisher Research Laboratory
FREDERICK, FRANCIS H.
Geodynamics, Inc.
Geo-Engineering
Geo-Optic Co., Inc.
Heinrichs Geoporation Co.
Hunting Airborne Geophysics Ltd.
Hunting Technical & Exploration
Services Ltd.
Hunting Technical Services, Inc.
Hullis, Carlson D.
Hycos Aerial Surveys, Inc.
International Geophysics, Inc.
LONGYEAR CO., E. J.
M-Scope—see Fisher Research Lab-
oratory, Inc.
Menlo Research Lab.
Mitchell, Miles J.
Moab Drilling Co.
Mobile Drilling Inc.
Nucleonic Corp. of America
Ore Research & Laboratories
Peale, Rogers
Permo Evaporation Co.
Precision Radiation Instruments,
Inc.
Radiac Co. Inc., The
Ray Drilling Co., Inc.
Shamrock Well Drilling Enterprises,
Inc.
Sloan & Associates, Inc.
St. Clair, John Q.
STILL & STILL
THOMAS, CONRAD WARD
United Geophysical Corp.
Uranium Enterprises
Uranium Exploration
Uranium Research & Devel. Co.
VAN HORN, EARL C.
Western Exploration Co.
Wilson Exploration Co.
WISSEK & COX
World Mining Consultants, Inc.
World Wide Aerial Surveys (Aust.)
Pty. Ltd.

Geophysical

Aero Service Corp.
African Surveys (Proprietary Ltd.)
Canadian Aero Service, Ltd.
Crallius Co. Ltd.
Engineers Syndicate, Ltd.
FAIRCHILD AERIAL SURVEYS,
INC.
FREDERICK, FRANCIS H.
Geodynamics, Inc.
Geo-Optic Co., Inc.
Geophysical Services, Inc.
Heinrichs Geoporation Co.
Hunting Airborne Geophysic Ltd.
Hunting Geophysical Services, Inc.
Hycos Aerial Surveys, Inc.
International Geophysics, Inc.
LONGYEAR CO., E. J.
Lundberg Explorations, Ltd.
M-Scope—see Fisher Research Lab-
oratory, Inc.
Menlo Research Lab.
Mining & Geophysical Services, Ltd.
Moab Drilling Co.
Mobile Drilling, Inc.
Nucleonic Corp. of America
Peale, Rogers
Precision Radiation Instruments,
Inc.
Radiac Co., Inc., The
Research, Inc.
Shamrock Drilling Enterprises
Sloan & Associates, Inc.
STILL & STILL
THOMAS, CONRAD WARD
Tracerlab, Inc.
United Geophysical Corp.
Western Exploration Co.
Wilson Exploration Co.
World Mining Consultants, Inc.
World Wide Aerial Surveys (Aust.)
Pty. Ltd.

EXPLOSIVES

See Blasting Supplies

FANS

See Ventilation Equipment and
Supplies

FASTENERS, BELT

ABCs Scale Division, McDowell Co.,
Inc.
Alligator—see Flexible Steel Lacing
Co.
American Rubber Mfg. Co.
Armstrong-Bray & Co.
Bonded Scale & Machine Co.
Clippert Belt Lacing
Continental Gin Co.
Crescent Belt Fastener Co., Inc.
Flexco—see Flexible Steel Lacing
Co.
Flexible Steel Lacing Co.
General Electric Co. Ltd., The
GOODALL RUBBER CO.
INTERNATIONAL B. F. GOOD-
RICH CORP.
National Mine Service Co.
Plategrip—see Armstrong-Bray &
Co.
Steelgrip—see Armstrong-Bray &
Co.
Talcott, Inc., W. O. & M. W.
Three Point Belt Lacing, Inc.

FEEDERS, ORE

Apron

American Brake Shoe Co., American
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Aveling-Barford
BARBER-GREENE CO., INC.
Baxter Ltd., W. H.
Bonded Scale & Mach. Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Cavison & Co. (Hexham) Ltd.
Demag Aktiengesellschaft
DENVER EQUIPMENT CO.
Eickhoff, Gebr. Maschinenfabrik u.
Eisenengiesserei G.m.b.H.
ELECTRIC STEEL FOUNDRY
CO.

Fraser & Chalmers
General Electric Co., Ltd., The
HACK ENGINEERING CO.
HADFIELD LTD.
HARDINGE CO., INC.
HAZEMAG
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-
Deuts., A. G.
Iowa Mfg. Co.
Jeffrey Manufacturing Co.
Kenco
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Klockner-Humboldt-Deuts., A. G.
LINK-BELT CO.
Lippmann Engineering Works
McDowell Co., Inc.
McLANAHAN & STONE CO.
McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
Morse Bros. Machinery Co.
NATIONAL IRON CO.
NORDBERG MFG. CO.
Pegson Ltd.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor &
Co., Inc.
Rex—see Chain Belt Co.
Richardson Scale Co.
Rogers Iron Works Co.
Ross Screen & Feeder Co.
Smith Engineering Works
SOUTHWESTERN ENG. CO.
STEPHENS-ADAMSON MFG. CO.
Richard Sutcliffe, Ltd.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
August Thiele G.m.b.H.
Tisco—see Taylor-Wharton Iron &
Steel Co.
TRAYLOR ENG. & MFG. CO.
Universal—see Pettibone Mulliken
Corp.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
Wilmet Engineering Co.

AIR

The Visco Engr. Co.

Belt

ABCs Scale Division, McDowell Co.,
Inc.
American Rubber Mfg. Co.
Aveling-Barford
B. L. F. Industries, Inc.
BARBER GREENE CO.
Bear—see American Rubber Mfg.
Co.
Bonded Scale and Machine Co.
Chain Belt Co.
Christian Engineers, J. D.

Coeur d'Alene Hardware & Foun-
dry Co.
Continental Gin Co.
Cresker-Jack—see American Rubber
Mfg. Co.
Demag Aktiengesellschaft
DENVER EQUIPMENT CO.
Flexible Steel Lacing Co.
Fraser & Chalmers
HACK ENG. CO.
HARDINGE CO., INC.
HAZEMAG
HEWITT-ROHNS, INC.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-
Deuts., A. G.
INTERNATIONAL B. F. GOOD-
RICH
Iowa Mfg. Co.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Klockner-Humboldt-Deuts., A. G.
LINK-BELT CO.
Lippmann Engineering Works
Magnetic Eng. & Mfg. Co.
McDowell Co., Inc.
McLANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
MINERS FOUNDRY & MFG. CO.
Morse Bros. Machinery Co.
The National Filter Media Corp.
Pegson Ltd.
Pettibone Mulliken Corp.
Pioneer Engineering, Div. Poor &
Co., Inc.
Rex—see Chain Belt Co.
Richardson Scale Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Richard Sutcliffe, Ltd.
TELLURIDE IRON WORKS CO.
THERMOID CO.
Universal Dredge Mfg. Co.
Universal Road Mach.
Washington Machinery Co.

Chain

American Brake Shoe Co., American
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Bonded Scale & Machine Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Demag Aktiengesellschaft
ELECTRIC STEEL FOUNDRY CO.
HACK ENG. CO.
HARDINGE CO., INC.
HAZEMAG
Hirsch Bros. Machy. Co.
Humboldt, Klockner-Humboldt-
Deuts., A. G.
Jeffrey Manufacturing Co.
Klockner-Humboldt-Deuts., A. G.
LINK-BELT CO.
Lippmann Engineering Works
Rex—see Chain Belt Co.
Ross Screen & Feeder Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Richard Sutcliffe, Ltd.
TELLURIDE IRON WORKS, CO.
Thiele, August G.m.b.H.
Universal Dredge Mfg. Co.

Constant Weight

ABCs Scale Division, McDowell Co.,
Inc.
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deuts.
AG
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
INDUSTRIAL PHYSICS & ELEC-
TRONICS CO.
International Combustion, Ltd.
LINK-BELT CO.
Merrick Scale Mfg. Co.
Poidometer—see Schaffer Poidome-
ter Co.
Richardson Scale Co.
Schaffer Poidometer Co.
Simplicity Engineering Co.
Syntron Co.
Washington Mach. Co.
Wayrol—see Jeffrey Manufacturing
Co., The

RECIPROCATING

GOULD & CO., GORDON I.
LINK-BELT CO.

DISC

DEISTER CONCENTRATOR CO.
LINK-BELT CO.

Pan

AMERICAN BRAKE SHOE CO.
Bonded Scale and Machine Co.

Chain Belt Co.
Christian Engineers, J. D.
Cleveland Vibrator Co., The
Coeur d'Alene Hardware & Foun-
dry Co.
Continental Gin Co.
ELECTRIC STEEL FOUNDRY
CO.
Fraser & Chalmers Eng. Wks.
HACK ENGINEERING CO.
HADFIELD LTD.
HAZEMAG
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-
Deuts., A. G.
Iowa Mfg. Co.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Klockner-Humboldt-Deuts., A. G.
LINK-BELT CO.
Lippmann Engineering Works
McLANAHAN & STONE
McNally Pittsburgh Co.
MINERS FOUNDRY & MFG. CO.
NATIONAL IRON CO.
Osw-Veyor—see Simplicity Eng.
Co.
Pioneer Engineering, Div. Poor &
Co., Inc.
Rex—see Chain Belt Co.
Rogers Iron Works
Scott's Concentrators
Simplicity Engineering Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Richard Sutcliffe, Ltd.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
Tisco—see Taylor-Wharton Iron &
Steel Co.
TRAYLOR ENG. AND MFG. CO.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.

REVOLVING

CONCENO—SEE DEISTER CON-
CENTRATOR CO.
DEISTER CONCENTRATOR CO.
LINK-BELT CO.

Table

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Carpo Mfg. Inc.
Chain Belt Co.
CONCENO—SEE DEISTER CON-
CENTRATOR CO.
Continental Gin Co.
DEISTER CONCENTRATOR CO.
Fraser & Chalmers Eng. Wks.
General Electric Co. Ltd., The
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-
Deuts., A. G.
Jeffrey Mfg. Co.
Klockner-Humboldt-Deuts., A. G.
LINK-BELT CO.
Puiva Corp.
Rex—see Chain Belt Co.
STEPHENS-ADAMSON MFG. CO.
TRAYLOR ENG. & MFG. CO.

REAGENT

ABCs Scale Div., The McDowell Co.
Clarkson Co., The
Com-Bin—see Puiva Corp.
Coeur d'Alene Hardware & Foun-
dry Co.
Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.
Eries Manufacturing Co.
Feederator—see Fischer & Porter
Co.
Fischer & Porter Co.
Galigher Co., The
Geary—see Galigher Co., The
Geary Junior—see Galigher Co., The
Humboldt, Klockner-Humboldt-
Deuts., A. G.
INDUSTRIAL PHYSICS & ELEC-
TRONICS CO.
INFILCO, INC.
JEFFREY MANUFACTURING CO.
Klockner-Humboldt-Deuts., A. G.
MASCO-ADAMS—SEE MINE &
SMELTER SUPPLY CO.
MINE & SMELTER CO.
Minerals et Metaux
Morse Bros. Machinery Co.
Syntron Co.
Wedag, A. G.
WESTERN MACHY. CO.

VIBRATING

Bin-Dictator Co., The
Carrier Conveyor Corp.
Eries Mfg. Co.
LINK-BELT CO.
Morgordshammars Mek. Verkstads
A.B.
Simplicity Eng. Co.
Syntron Co.

FILTER MEDIA

Aloxite—see Carborundum Co., The
Aloxan Air Filter Co. Inc.
Burwell—see Minerals Eng. Co.
Cellite—see Johns-Manville
Cleveland Wire Cloth & Mfg. Co.,
The
Carborundum Co., The
COAST MFG. & SUPPLY CO.
Dicalite Div., Great Lakes Carbon
Corp.
DORR-OLIVER INC.
EIMCO CORP., THE
Feon—see Filtration Engineers Div.
Filtration Engineers, Div. Ameri-
can Machine & Metals, Inc.
Filter Fabrics, Inc.
Johns-Manville Sales Corp.
Ludlow-Saylor Wire Cloth Co.
NATIONAL FILTER MEDIA
CORP.
NFM—SEE NATIONAL FILTER
MEDIA CORP.
Norton Company
Pendleton Woolen Mills
Peterson Filters & Eng. Co.

FILTERS

AIR

ATD Mufflers—see Allied Witan
Co., Inc.
American Air Filter Co., Inc.
ATLAS COPCO, A. B., SWEDEN
Bemis Bro. Bag Co.
Carriers Corp.
CHICAGO PNEUMATIC TOOL
CO.
Condensafilter—see Hankison Corp.
Coppus Engineering Corp.
DrAir—see New Jersey Motor Co.
Duson Co.
GARDNER DENVER CO.
Hankison Corp.
HAZEMAG OF GERMANY
Humboldt, Klockner-Humboldt-
Deutz, A. G.
International Combustion (Export)
Ltd.
Johnson March Corp.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Mine Safety Appliances Co.
New Jersey Motor Co.
Staplex Co., The
Thor Power Tool Co.
Ultra-air—see Mine Safety Appli-
cances Co.
Watts Regulator Company
WESTERN PRECIPITATION
CORP.
Westinghouse Air Brake Co., Ind.
Products Div.
Westinghouse Electric Corp., Stur-
tevant Div.
Wheelabrator Corp.
Winslow Engineering & Mfg. Co.

CONCENTRATE

AMERICAN—SEE DORR-OLIVER
INC.
Bee-Tee—see Galigher Co., The
Bemis Bros. Bag Co.
Bird Machine Co.
Buck & Associates, Carl
BURT—SEE MINE & SMELTER
SUPPLY CO.
Carpeo Mfg. Inc.
DENVER EQUIPMENT CO.
DORR-OLIVER INC.
Dorr-Oliver G.m.b.H.
DORR-OLIVER—SEE DORR-OLIVER,
INC.
EIMCO CORP., THE
Fein—see Filtration Engineers,
Div.
Filtration Engineers, Div.—Ameri-
can Machine & Metals, Inc.
Galigher Co., The
HARDINGE CO., INC.
Hirsch Bros. Machy Co.
Humboldt, Klockner-Humboldt-
Deutz, A. G.
INFILCO, INC.
International Combustion Ltd.
KELLY—SEE DORR-OLIVER,
INC.
MINE & SMELTER SUPPLY CO.
Morse Bros. Machinery Co.
OLIVER—SEE DORR-OLIVER,
INC.
Peterson Filters & Engineering Co.
SWEETLAND—SEE DORR-
OLIVER, INC.

OH

DORR-OLIVER, INC.
Dorr-Oliver G.m.b.H.
Filpro—see U. S. Hoffman Machy.
Co.
GARDNER-DENVER CO.
INFILCO, INC.

Humboldt, Klockner-Humboldt-Deutz
AG
Schoonmaker Co. Inc., P. G.
Tamping Bag Co., The
Thor Power Tool Co.
U. S. Hoffman Machinery Corp.
Winslow-Weld—see Winslow Eng.
& Mfg. Co.
Winslow & Mfg. Engineering Co.

FIRE BRICKS

See Also Refractories
BARCOCK & WILCOX CO., THE
Carborundum Co., The
DENVER FIRE CLAY CO., THE
Johns-Manville Sales Corp.
Kaiser Aluminum & Chem. Corp.
Mexico Refractories Co.
Robinson Clay Prod. Co., The
SPANG & CO.
John G. Stein & Co., Ltd.
Utah Fire Clay Co.

FIRST AID SUPPLIES

See Safety Equipment

FLOTATION MACHINES

Agitair—see Galigher Co., The
Amag-Hilbert-Pegritshutte A.G.
Booth Co., Inc.
Coeur d'Alene Hardware & Found-
ry Co.
Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.
FAGERGREN & STEFFENSEN
—SEE WESTERN MACHIN-
ERY CO.
Fraser & Chalmers
Galigher Co., The
Humboldt, Klockner-Humboldt-
Deutz, A. G.
INFILCO, INC.
International Combustion Products,
Ltd.
JETAIR—SEE MORSE BROS.,
MACHINERY CO.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
Krupp, Fried. Maschinen und Stahl-
bau Rheinhausen
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
Minemet—see Minerals et Metaux
Minerals et Metaux
Morse Bros. Machinery Co.
NATIONAL TANK & PIPE CO.
SANTA FE TANK DIV., FLUOR
PRODUCTS CO.
STEARNS-ROGER MFG. CO.
U. S. Hoffman Mach. Corp.
WEDAG (Westfalia Dinnedahl
Groppe AG)
WEMCO-FAGERGREN—SEE
WESTERN MACH. CO.
WESTERN MACHINERY CO.
Westinghouse Electric Corp., Stur-
tevant Div.

FLOTATION REAGENTS

See Reagents and Chemicals

FRAMERS

See Saws, Power

FRICTION MATERIAL

AMERICAN BRAKE SHOE CO.
Graphite Metallizing Corp.
INTERNATIONAL B. F. GOOD-
RICH CORP.
Johns-Manville Sales Corp.
THERMOLD CO.
Tool Steel Gear & Pinion Co.
Velvetouch Ceramic—see Wellman
Co., The S.K.
Wagner Electric Corp.
Wellman Co., S.K.

FURNACES

See Pyrometallurgical
Equipment

FUSE

See Blasting Equipment

GAS TURBINES

Solar Aircraft Co.

GATES

See Bins, Chutes and
Accessories

GAUGES

Air Reduction Sales Co.
Aldon Co.
Beckman Instruments, Inc.
Bristol Co., The
Davison & Co. (Hexham) Ltd.
Foxboro Co., The
GENERAL ELECTRIC CO.,
INTERNATIONAL
Lufkin Rule Co., The
Lunkenheimer Co., The
Minneapolis-Honeywell Regulator
Co.
Norwood Controls Unit
Tracerlab, Inc.
Weston Electrical Instrument Corp.

GEAR MOTORS

See Motors

GEARS

See also Speed Changers; Open
Gearing; Drives; Shaft-Mounted
Drives
American Brake Shoe Co., American
Manganese Steel Div.
AMCO—SEE AMERICAN BRAKE
SHOE CO.
Brown Corp. (Sales) Ltd. David
BROWN, INC., DAVID
Brown Industries, David
Christian Engineers, J. D.
Cleveland Worm & Gear Co., The
Coeur d'Alene Hardware & Foundry
Co.
COLUMBIA STEEL CASTING CO.
INC.
Demag Aktiengesellschaft
Dodge Mfg. Corp.
Falk Corp., The
Farrel-Birmingham Co., Inc.
GENERAL ELECTRIC CO., IN-
TERNATIONAL
HEWITT-ROBINS, INC.
Humboldt, Klockner-Humboldt-Deutz
AG
Jeffrey Manufacturing Co.
LINK-BELT CO.
Napco Industries Inc.
Ohio Gear Co.
Philadelphia Gear Works, Inc.
Salzgitter Maschinen Aktienges-
schaft
Schoonmaker Co. Inc., P. G.
STEARNS-ROGER MFG. CO., THE
STEFFENSEN ADAMSON MFG. CO.
Taylor-Wharton Iron & Steel Co.
Tool Steel Gear & Pinion Co., The
Universal Gear Works, Inc.
Vulcan Iron Works, (Pa.)
Walker Bros. (Wigan) Ltd.
Western Foundry Co.
Western Gear Corp. (Calif.)
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.
Worthington Corp.
Yuba Mining Co.

Grinding Equipment

GEIGER & SCINTILLATION COUNTERS

See also Exploration Equipment

ACEC
Atomia Engineering Corp.
Babbal—see Uranium Eng. Co.
Braun-Knecht-Heimann Co.
Carpeo Mfg. Inc.
COLORADO ASSAYING CO.
Custom—see Precision Radiation In-
struments
De Luxe—see Precision Radiation
Instruments
Eberline Inst. Div., Reynolds Elect.
& Eng. Co.
Electro-Technical Labs.
Engineers Syndicate, Ltd.
Fisher Research Laboratory
Gammacot—see Atomic Engineering
Corp.
GENERAL ELECTRIC CO., IN-
TERNATIONAL
Hyscon Aerial Survey, Inc.
Junction Bit & Tool Co.
La Roe Instruments, Inc.
Menlo Research Lab.
Mt. Sopris Inst. Corp.
Nucleonics Corp. of America
Phillips Electronics, Inc., Instru-
ments Div.
Precision Radiation Instruments,
Inc.
Professional—see Precision Radia-
tion Inst.
Radiac Co., Inc., The
Snooper—see Precision Radiation
Inst.
Snyders Mine & Chemical Lab.
Special—see Precision Radiation
Inst.
Standard—see Precision Radiation
Inst.
Technical Associates
Tracerlab, Inc.
Uranium Engr. Co.
Uranium Enterprises
ULTRA VIOLET PROD., INC.
White's Electronics

GENERATORS

See Electrical Equipment

GEOPHYSICAL SURVEYS

See Exploration Services

GIANTS

See Monitors

GRADERS

ADAMS—SEE LE TOURNEAU-
WESTINGHOUSE CO.
Allis-Chalmers Manufacturing Co.,
Const. Machy. Div.
ALLIS-CHALMERS MFG. CO., IN-
DUSTRIES GROUP
AUSTIN-WESTERN—SEE BALD-
WIN-LIMA-HAMILTON CORP.
Aveling-Barford
Caterpillar Tractor Co.
Exelon Company, The
Hais Mfg. Co., Inc.
Huber Warco Co.
LE TOURNEAU-WESTINGHOUSE
CO.
Pettibone Mulliken Corp.
Speedgrader—see Pettibone Mulli-
ken Corp.
Yuba Consolidated Industries, Inc.

GRINDERS

See Sharpeners, Rock Bit

GRINDING EQUIPMENT

See also Pulverizers

AUTOGENOUS

Humboldt, Klockner-Humboldt-Deutz
AG

BALL MILLS

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP

**Manufacturer's Complete Names and Ad-
resses are listed in Section II, last pages
of this yellow section. Firms appearing in
boldface caps carry advertisements in
this issue.**

Grizzlies

BARCOCK & WILCOX CO.
BALFEB—SEE ALLIS-CHALMERS MFG. CO.
F. J. Brindley & Sons (Sheffield) Ltd.
Coeur d'Alene Hardware & Foundry Co.
COMPEN—SEE ALLIS-CHALMERS MFG. CO.
DENVER EQUIPMENT CO.
DRAYO CORP.
EMCO CORP., THE
Bach-Werke, K. G.
Foster Wheeler Corp.
Fraser & Chalmers Eng. Wks.
Galigher Co.
Knapp & Bates, Ltd.
Krupp, Frupp, Maschinen und Stahlbau Rheinhausen
HARDINGE CO., INC.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-Deuts, A. G.
International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deuts, A. G.
Knapp & Bates, Ltd.
LAKE SHORE, INC.
Live Roller Mills Mfg. Co.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
Morse Bros. Machinery Co.
NORDBERG MFG. CO.
Pegson Ltd.
Rb-Conc—see Stranb Mfg. Co., Inc.
SMITH & CO., F. L.
STEARNS-ROGER MFG. CO.
THUNES MEK. VERKSTED, A. S.
TRAYLOR ENG. & MFG. CO.
Union Iron Works
Wilkinson Rubber Linatex, Ltd.

BALLS

ACF Industries, Inc., American Car & Foundry Div.
ALLIS-CHALMERS MFG. CO.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO.
BARCOCK & WILCOX CO., THE
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
C F & I—SEE COLORADO FUEL & IRON CORP., THE
Calumet & Hecla, Inc., Calumet Div.
Carlex—see Coates Steel Products Co.
Coates Steel Products Co.
Coeur d'Alene Hardware & Foundry Co.
COLORADO FUEL & IRON CORP., THE
CONCAVEY—SEE ALLIS-CHALMERS MFG. CO.
Firth Sterling, Inc.
Foster Wheeler Corp.
General Motors Corp., New Department Division
HADFIELD LTD.
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE LTD.
Humboldt, Klockner-Humboldt-Deuts AG
International Combustion Ltd.
Kennametal, Inc.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deuts, A. G.
Knapp & Bates, Ltd.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
MINE & SMELTER SUPPLY CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Ni Hard—see Calumet & Hecla, Inc., Calumet Div.
SHEFFIELD DIV., ARMCO STEEL CORP.
S K F Industries Inc.
U. S. STEEL CORP., COLUMBIA-GENEVA STEEL DIV.
USS—SEE U. S. STEEL CORP.
UNITED STATES STEEL EXPORT CO.
Western Foundry Co.

LINERS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
American Brake Shoe Co., American Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BARCOCK & WILCOX CO., THE
Bethlehem Pacific Coast Steel Co.
Calumet & Hecla, Inc., Calumet Div.

Coeur d'Alene Hardware & Foundry Co.
COLUMBIA STEEL CASTING CO., INC.
DENVER EQUIPMENT CO.
EMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
HADFIELD LTD.
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE LTD.
Humboldt, Klockner-Humboldt-Deuts AG
International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Knapp & Bates, Ltd.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
MCLANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
NATIONAL MALLEABLE & STEEL CASTING CO.
Ni Hard—see Calumet & Hecla, Inc., Calumet Div.
Sanford-Day Iron Works Inc.
SMITH & CO., F. L.
Taylor-Wharton Iron & Steel Co.
TRAYLOR ENG. & MFG. CO.
USS—SEE U. S. STEEL CORP.
UNITED STATES STEEL EXPORT CO.
U. S. STEEL CORP., COLUMBIA-GENEVA DIV.
Washington Iron Works
Western Foundry Co.

PEBBLE MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
DENVER EQUIPMENT CO.
DRAYO CORP.
EMCO CORP., THE
Fraser & Chalmers Eng. Wks.
General Electric Co. Ltd., The
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE LTD.
Humboldt, Klockner-Humboldt-Deuts AG
Klockner-Humboldt-Deuts, A. G.
Knapp & Bates Ltd.
International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deuts, A. G.
Knapp & Bates, Ltd.
Live Roller Mills Mfg.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NORDBERG MANUFACTURING CO.
Pegson Ltd.
SMITH & CO., F. L.
STEARNS-ROGER MFG. CO.
THUNES MEK. VERKSTED, A. S.
TRAYLOR ENG. & MFG. CO.
U. S. STEEL CORP.
Wilkinson Rubber Linatex, Ltd.

ROD MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Bethlehem Pacific Coast Steel Corp.
COLORADO FUEL & IRON CORP.
DENVER EQUIPMENT CO.
DRAYO CORP.
EMCO CORP., THE
General Electric Co. Ltd., The
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE LTD.
Humboldt, Klockner-Humboldt-Deuts, A. G.
International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deuts, A. G.
Knapp & Bates, Ltd.
Live Roller Mills Mfg. Co.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
Morse Bros. Machinery Co.
Pegson Ltd.
STEARNS ROGER MFG. CO. (ROD CHARGERS)
THUNES MEK. VERKSTED, A. S.
TRAYLOR ENG. & MFG. CO.

RODS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Bethlehem Pacific Coast Steel Corp.
Bethlehem Steel Export Corp.
C F & I—SEE COLORADO FUEL & IRON CORP., THE

COLORADO FUEL & IRON CORP.
HADFIELD LTD.
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deuts AG
Kennametal, Inc.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Knapp & Bates, Ltd.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
MINE & SMELTER SUPPLY CO.
SHEFFIELD DIV., ARMCO STEEL CORP.
U. S. STEEL CORP., COLUMBIA-GENEVA DIV.
United States Steel Export Co.
Youngstown Sheet & Tube Co., The

TUBE MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
DRAYO CORP.
EMCO CORP., THE
Fraser & Chalmers Eng. Wks.
General Electric Co. Ltd., The
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE LTD.
Humboldt, Klockner-Humboldt-Deuts, A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deuts, A. G.
Knapp & Bates, Ltd.
LAKE SHORE, INC.
Live Roller Mills Mfg. Co.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
NORDBERG MFG. CO.
Pegson Ltd.
SMITH & CO., F. L.
THUNES MEK. VERKSTED, A. S.
TRAYLOR ENG. & MFG. CO.

GRIZZLIES

See Screens, Grizzlies and Accessories

GROUTING

See also Concreting Equipment

EQUIPMENT
Air Placement Equip. Co.
Air Place—see Air Placement Equip. Co.
CEMENT GUN CO.
CHICAGO PNEUMATIC TOOL CO.
Cementation Co. Ltd. The
Craelius Co. Ltd.
DIAMOND DRILL CONTRACTING CO.
Grout-or Blast—see Air Placement Equip. Co.
Gunite—see Air Placement Equip. Co.
INTERNATIONAL B. F. GOOD-RICH
Koehring Co.
LONGYEAR CO., E. J.
Mayo Tunnel & Mine Equipment
Mobile Drilling Inc.
MORSE BROS. MACHINERY CO.
Pendrill—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.
SPRAGUE & HENWOOD, INC.
Thor Power Tool Co.
Torkret G.m.b.H.
True Gun-All Equipment Corp.

SERVICES

Cementation Co. Ltd. The
DIAMOND DRILL CONTR. CO.
DRAYO CORP.
McKensie & Whittle Contractors
Mobile Drilling Inc.
EARL C. VAN HORN

HARD FACING

See Welding Equipment and Supplies

HATS

See Safety Equipment

HAULAGE UNITS, OFF-RAIL

See also Truck and Trailers; Self Loading Transport; Shuttle Cars

Allis-Chalmers Mfg. Co., Construction Machy. Div.
Autocar—see The White Motor Co., Autocar Trucks Div.
CW—see Curtiss-Wright Corp., South Bend Div.
CURTIS-WRIGHT CORP., SOUTH BEND DIV.
DART TRUCK CO.
Differential Steel Car Co.
Easton Car & Construction Co.
Elmo Corp., The
EUCLID DIVISION, GENERAL MOTORS CORP.
Four Wheel Drive Auto Co., The
Frushauf—see Frushauf Trailer Co.
Frushauf Trailer Co.
Gallon Allsteel Body Co.
GENERAL MOTORS CORP., EUCLID DIV.
GENERAL MOTORS OVERSEAS OPERATIONS
GETMAN BROTHERS MFG. CO.
GETMAN SHUTTLE CARS—SEE GETMAN BROS.
Giamco—see Sanford Day Iron Works, Inc.
Goodman Mfg. Co.
Hell Co., The
Howe Scale Co.
INTERNATIONAL HARVESTER CO.
Jeffrey Mfg. Co., The
JOY MANUFACTURING TRUCK CO.
Carl Kaehle
Koehring Co.
Laudis Steel Co.
LE TOURNEAU-WESTINGHOUSE CO.
Napco Industries, Inc.
Ortrac, Inc.
Sanford-Day Iron Works, Inc.
SCOOT-CRETE—SEE GETMAN BROS. MFG. DIV., INC.
TOURNAHOPPER—SEE LE TOURNEAU-WESTINGHOUSE CO.
TOURNAULL—SEE LE TOURNEAU-WESTINGHOUSE CO.
TOURNAROCKER—SEE LE TOURNEAU-WESTINGHOUSE CO.
Uhden, Inc.
Westinghouse Air Brake Co., Le
Roi Div.
White Motor Co., Autocar, Trucks Div.

HEADFRAMES

STEEL
ALLISON STEEL MFG. CO.
Coeur d'Alene Hardware & Foundry Co.
Connellsville Mfg. & Mine Supply Co.
Demag Aktiengesellschaft
HACK ENG. CO.
HEAD WRIGHTSON, STOCKTON FORGE LTD.
Humboldt, Klockner-Humboldt-Deuts, A. G.
LAKE SHORE, INC.
Mayo Tunnel & Mine Equip.
NATL. IRON CO.
Silent Glow Oil Burner Corp.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Washington Iron Wks.
TIMBER
Koppers Co., Inc.

HEATERS

AIR
American Air Filters Co., Inc.
Carrier Corp.
DRAYO CORP.
Foster Wheeler Corp.
General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
GRAYBAR ELECTRIC CO., INC.
Grinnell Co., Inc.
Humboldt, Klockner-Humboldt-Deuts AG
International Combustion Ltd.
Klockner-Humboldt-Deuts, A. G.
Loesche, Germany

Silent Glow Oil Burner Corp.
Surface Combustion Corp.
Thermolier—see Grinnell Co., Inc.
USCO—see International Combustion Ltd.
Watlow Elec. Mfg. Co.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp., Sturtevant Div.

SPACE

American Air Filter Co., Inc.
American Blower Corp.
Carrier Corp.
DRAYO CORP.
General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
GRAYBAR ELECTRIC CO., INC.
Humboldt, Klockner-Humboldt-Deutz AG
Iron Fireman Mfg. Co.
Silent Glow Oil Burner Corp.
Surface Combustion Corp.
U. S. Rubber Co.
Watlow Electric Mfg. Co.
Westinghouse Electric Corp., Sturtevant Div.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

HOIST**COMMUNICATIONS**

See Communications

HOIST CONTROLS and SAFETY EQUIPMENT

ACEC
Bullard Co., E. D.
Fraser & Chalmers Eng. Wks.
LILLY—SEE LOGAN ENGR. CO.
LOGAN ENGR. CO.
SIMPLEX—SEE LOGAN ENGR. CO.

HOISTING CABLE

See Rope, Wire

HOISTING EQUIPMENT

See also Chain Hoists; Rope, Wire

AUTOMATIC SKIP LOADING DEVICES

Alimak-Verken AB
ASEA, SWEDEN
Barker, Davies & Co.
Connellsville Mfg. & Mine Supply Co.
Demag Aktiengesellschaft
Hirsch Bros. Mfg. Co.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
LINK-BELT CO.
McDowell Co., Inc.
Shaft & Development Machines, Inc.

FRICITION HOISTS

American—see American Hoist & Derrick Co.
American Hoist & Derrick Co.
ASEA ELECTRIC INC.
ASEA, SWEDEN
Barker, Davies & Co.
BLACK'S MINING EQUIPMENT, LTD.
Clyde Iron Works, Inc.
Connellsville Mfg. & Mine Supply Co.
Duff-Norton Co.
EISENHUTTE PRINZ RUDOLPH, A.G.
Fraser & Chalmers Eng. Wks.
Mayo Tunnel & Mine Equipment
Texas Gulf Sulphur Co.
Washington Iron Works
John Wood & Sons, Ltd.

MINE SHAFT HOISTS Drum

Alimak-Verken AB
ASEA, SWEDEN
Atlas Copco Pacific, Inc.
ATLAS COPCO AB, SWEDEN
Clyde Iron Wks., Inc.
Coeur d'Alene Hardware & Foundry Co.

Connellsville Mfg. & Mine Supply Co.
Demag Aktiengesellschaft
Eisenhutte Prinz Rudolph, A.G.
Electric Controller & Mfg. Co.
Fraser & Chalmers Eng. Wks.
GARDNER-DENVER CO.
General Electric Co. Ltd., The
Gregg Co., Ltd.
Hirsch Bros., Machinery Co.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Kema (Kohn-Ehrenfelder Maschinenbau-Anstalt)
LAKE SHORE, INC.
McDowell Co., Inc.
John Mills & Co.
NORDBERG MFG. CO.
The Nolan Co.
Ohio Hoist & Mfg. Co.
Rogers Iron Works Co.
Shepard Niles Crane & Hoist Corp.
STEARNS ROGER MFG. CO.
Superior-Lidgerwood-Mundy Corp.
TELLURIDE IRON WKS.
Texas Gulf Sulphur Co.
VULCAN-DENVER—SEE VULCAN IRON WORKS
VULCAN IRON WORKS
Washington Iron Wks.
Western Gear Wks.
John Wood & Sons, Ltd.
Yuba Consolidated Industries, Inc.

Keeps

ASEA
Eisenhutte Prinz Rudolph, A.G.

SCRAPER HOISTS (slushers) Portable

American Chain & Cable Co., Inc., Wright Hoist Div.
American Hoist & Derrick Co.
ATLAS COPCO PACIFIC, INC.
ATLAS COPCO, A. B., SWEDEN
Brownlie—see Sanford Day Iron Works, Inc.
Cecil S. A.—see Grapohist, Inc.
CHICAGO PNEUMATIC TOOL CO.
Clyde Iron Wks.
Consolidated Pneumatic Tool Co., Ltd.
Dusterloh, G. Fabrikfur Bergwerksbedarf G.m.b.H.
EMCO CORP., THE
GARDNER-DENVER CO.
Grapohist, Inc.
HARNISCHFEGGER CORP.
Hassenecker (Maschinenfabrik) A.G.
Holman Bros. Ltd. (England)
Holman Bros. (Canada) Ltd.
Hoskinson & Co., Ltd., Austin
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Ledeen Mfg. Co.
Lug-All Co., The
Mixermobile Mfg. Inc.
National Supply Co. (Pa.)
Ohio Hoist & Mfg. Co.
Princeton Grapohist, Inc.
Round Chain Co's.
Sanford Day Iron Wks.
Scoopmobile—see Mixermobile Mfg. Inc.
Shepard Niles Crane & Hoist Corp.
Uhrden, Inc.
VULCAN-DENVER—VULCAN IRON WORKS, DENVER, COLO.
Vulcan Iron Works (Pa.)

Stationary

American Chain & Cable Co., Inc., Wright Hoist Div.
American Hoist & Derrick Co., Inc.
ATLAS COPCO, A. B., SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Bies Bros.
Clyde Iron Wks., Inc.
EISENHUTTE PRINZ RUDOLPH, A.G.
Eisenwerke Mulheim Melderich, A.G.
Gar Wood Industries, Inc.
Grindral Air Prod. Co.
HARNISCHFEGGER CORP.
Holman Bros. Ltd.
INGERSOLL-RAND CO.

JOY MANUFACTURING CO.
LAKE SHORE, INC.
John Mills & Co.
NATIONAL IRON CO.
National Supply Co. (Pa.)
Ohio Hoist & Mfg. Co.
Round Chain Co's.
Sanford Day Iron Wks.
SAUERMAN BROS., INC.
Shepard Niles Crane & Hoist Corp.
STEARNS-ROGER MFG. CO.
Uhrden, Inc.
VULCAN-DENVER—SEE VULCAN IRON WORKS, DENVER, COLO.
VULCAN IRON WORKS (DENVER)
Washington Iron Works

SKIPS AND CAGES

W. G. Allen & Sons (Tipton) Ltd.
Allison Steel Mfg. Co.
American Brake Shoe Co., American Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE
ASEA, SWEDEN
ATLAS CAR & MFG. CO., THE
Barker, Davies & Co.
CARD IRON WORKS CO., THE
C. S.
Clyde Iron Works, Inc.
Coeur d'Alene Hardware & Foundry Co.
Connellsville Mfg. & Mine Supply Co.
Demag Aktiengesellschaft
Easton Car & Construction Co.
Gregg Co., Ltd.
HACK ENGINEERING CO.
HEAD WRIGHTSON, STOCKTON FORGE, LTD.
Hirsch Bros. Machinery Co.
JETO-SKIP—SEE LAKE SHORE, INC.
LAKE SHORE, INC.
Mayo Tunnel & Mine Equip.
McDowell Co., Inc.
MINERS FOUNDRY & MFG. CO.
NATIONAL IRON CO.
Nolan Co., The
NORDBERG MFG. CO.
Ohio Hoist & Mfg. Co.
Rogers Iron Works Co.
Sanford-Day Iron Works, Inc.
STEARNS ROGER MFG. CO.
TELLURIDE IRON WORKS CO.
Universal Dredge Mfg. Co.
VULCAN-DENVER—SEE VULCAN IRON WORKS, DENVER, COLORADO
VULCAN IRON WORKS (COLO.)
Vulcan Iron Works (Pa.)
Wellman Engineering Co., The

HOSE

Air Reduction Sales Co.
American Rubber Mfg. Co.
ATLAS COPCO, A. B., SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Band-it Co.
Bear—see American Rubber Mfg. Co.
Bonded Scale & Machine Co.
Boston Woven Hose & Rubber Co.
Buck & Associates, Carl
Carlyle Rubber Co., Inc.
Carmac—see Carl Buck & Associates
CHICAGO PNEUMATIC TOOL CO.
Condor—see Raybestos-Manhattan, Inc.
Clearstream-Garden—see Yardley Plastics Co.
Crackerjack—see American Rubber Mfg. Co.
EMCO CORP., THE
Gates Rubber Co.
GOODALL RUBBER CO.
Goodrich Co., B. F., Industrial Prod. Div.
Goodyear Tire & Rubber Co.
HEWITT-ROBINS, INC.
Grindral Air Prod. Co.
INTERNATIONAL B. F. GOOD-RICH
JOY MFG. CO.

Lee Rubber & Tire Corp., Republic Rubber Div.
PORTER CO., H. K., QUAKER RUBBER DIV.
Quaker Pioneer Rubber Mills
Raybestos—Manhattan, Inc.
Republic Rubber Div., Lee Rubber & Tire Corp.
Stenberg Corp. of Canada Ltd.
Stewart-Warnock Corp.
Tamping Bag Co., Div., Pickard Industries, Inc.
THERMOID CO.
Thor Power Tool Co.
United States Rubber Co.
U. S. Rubber Inc.
Westinghouse Air Brake Co., Ltd.
Yardley Plastics Co.
Yosemita—see American Rubber Mfg. Co.

HYDROSEPARATORS

See Thickeners and Tanks; Classifiers

IDLERS

See Conveyor Equipment

INCREASERS, SPEED

See Speed Changers

INSTRUMENTS

See Engineering Supplies; Surveying Instruments; Controls

ION EXCHANGE RESINS

See Reagents and Chemicals

JIGS

See Concentrating Equipment

JIM CROWS

See Track and Accessories

JUMBOS

See Drills, Rock

KILNS

See Dryers and Kilns; Coolers

LABORATORIES AND ASSAYERS

Abbott Hanks, Inc.
Agence Miniere & Maritime S. A.
ARIZONA TESTING LABORATORIES
BLACK & DEASON
BOOTH CO., INC.
Braun Chemical Co.
Braun-Knecht-Heimann Co.
Carpeo Mfg. Inc.
Central Scientific Co. of Calif.
CHAPMAN AND WOOD
COLORADO ASSAYING CO., THE
Custom Assay Offices
DEGGENDORFER, T. G.
DENVER EQUIPMENT CO.
DICKINSON LABORATORIES, INC.
El Paso Testing Laboratories
Engineers Syndicate, Ltd.
Gallagher Co., The
GOODALL BROS.
Hanks, Inc. & Abbott A.
HAWLEY & HAWLEY
Imperial Chemical Industries, Ltd.
Junction Bit & Tool Co.
KENNEDY—VAN SAUN MFG. & ENG. CORP.
Knapp & Bates, Ltd.
Lodoux & Co.
Lorch Bros., Inc.
Mack, Peter

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Laboratory Equipment and Supplies

Menlo Research Lab.
Minerals Laboratory
Mobile Drilling, Inc.
Nichols Laboratories, Inc.
Ore Research & Laboratories
Osborne Laboratories, Inc. Raymond G.
Philips Electronics, Inc., Instruments Div.
REED ENGINEERING
Research Inc.
Root & Simpson, Inc.
Smith-Emery Co.
Snell Inc., Foster D.
SOUTHERN SPECTROGRAPHIC LABORATORY
Stearns Magnetic, Inc.
Stowell & Co., W. E.
STURTEVANT MILL CO.
Twining Laboratories, The
Udy, Marvin J.
WOOD ASSAYING CO., HENRY E.

LABORATORY EQUIPMENT AND SUPPLIES

See also Reagents and Chemicals

Laboratory and Testing Machines

Agitair—see Galigher Co., The
Ainsworth & Sons, Inc., Wm.
Ainsworth Balances—see Ainsworth & Sons, Inc.
BALDWIN-LIMA-HAMILTON CORP.
Bauch & Lomb Optical Co.
Beckman Instruments, Inc., Selective Instruments Div.
Bico, Inc.
Booth Co., Inc.
Braun-Knecht-Heimann Co.
Carpeo Mfg., Inc.
Central Scientific Co. of Calif.
Davison & Co. (Haxham) Ltd.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
DFC—SEE DENVER FIRE CLAY CO., THE
DICKINSON LABORATORIES, INC.
Dings Magnetics Separator Co.
Engineers Syndicate, Ltd.
Galigher Co.
GENERAL ELECTRIC CO., INTERNATIONAL
General Mach. Co.
HARDING CO., INC.
Humboldt, Klockner - Humboldt-Deutz AG
Humphreys Investment Co.
International Combustion Ltd.
Kentron—see Torsion Balance Co., The
Knapp & Bates, Ltd.
Ladoux & Co.
Lerlab Supply Co.
MacBeth Inst. Corp.
MASSCO—SEE MINE & SMELTER SUPPLY CO.
Menlo Research Laboratory
MINE & SMELTER SUPPLY CO.
Minerals et Metaux
Morgendammars Mek. Verkstad A.B.
Morse Bros. Machinery Co.
Nucleonic Corp. of America
Philips Electronics, Inc., Instruments Div.
Photovolt Corp.
Precision Radiation Inst., Inc.
Pulva Corp.
Pyrometer Instrument Co. Inc.
Rawson Electrical Inst. Co.
RO-TAP—SEE TYLER CO., THE W. S.
Sapor Microsplitter Supply
SOUTHWESTERN ENGINEERING CO.
Staplex Co., The
Stearns Magnetic, Inc.
STURTEVANT MILL CO.
Thompson Balance Co.
Torsion Balance Co., The
TY-LAB—SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
ULTRA VIOLET PROD., INC.
Universal Vibrating Screen Co.
Voland & Sons, Inc.
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.

MISCELLANEOUS LABORATORY SUPPLIES

Allied Chem. & Dye Corp., General Chem. Div.

Baker & Adamson—see Allied Chemical & Dye Corp., General Chem. Div.
Bauch & Lomb Optical Co.
Bico, Inc.
Booth Co., Inc., The
Braun-Knecht-Heimann Co.
Carpeo Mfg., Inc.
Carrier Corp.
Central Scientific Co. of Calif.
Combustion Engineering Inc., Raymond Div.
DFC—SEE DENVER FIRE CLAY CO.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
Engineers Syndicate, Ltd.
Fischer & Porter Co.
Hevi-Duty Electric Co.
Hoffman Bros. Drilling Co.
INDUSTRIAL PHYSICS & ELECTRONICS CO.
International Combustion, Ltd.
Knapp & Bates, Ltd.
Lerlab Supply Company
Live Roller Mills Mfg. Co.
Menlo Research Lab.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Nucleonic Corp. of America
Rapid Magnetic Machines, Ltd.
Sayder's Mine & Chemical Lab
STURTEVANT MILL CO.
Thompson Balance Co.
ULTRA-VIOLET PRODUCTS, INC.

LACING, BELT

See Fasteners, Belt

LAMPS, MINER

See Safety Equipment

LIGHT PLANTS

See Electrical Equipment

LIGHTS

See Safety Equipment

LINERS

See Grinding Equipment

LOADERS, FRONT END AND OVERHEAD

See also Tractors and Attachments; Self-Loading Transport; Train Loader Systems

CRAWLER

Agricut—see Joast Mfg. Co.
Allis-Chalmers Manufacturing Co., Const. Machy. Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
American Brake Shoe Co., Amer. Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ATLAS COPCO, A. B., SWEDEN
AUSTIN-WESTERN—SEE BALDWIN-LIMA-HAMILTON CORP.
BARBER-GREENE CO.
Caterpillar Tractor Co.
DROTT MFG. CO.
EIMCO CORP., THE
Goodman Mfg. Co.
HARNISCHFGER CORP.
Hough Co., The, Frank G.
International Harvester Export Co.
Jeffrey Mfg. Co., The
JOY MANUFACTURING CO.
Lodover—see Service Supply Co.
MARION POWER SHOVEL CO.
Merton Engineering Co., Ltd.
Minneapolis-Moline Co.
Oliver Corp., The
Payloader—see Hough Co., The, Frank G.
Salzgitter Maschinen Aktiengesellschaft
Sanford Day Iron Wks.
Service Supply Corp.
Skid-Shovel—see Drott Mfg. Corp.
Tractomotive Corp.
Tracto-Shovel—see Tractomotive Corp.

Traxevator—see Caterpillar Tractor Co.
VICKERS-ARMSTRONGS (TRACTORS) LTD.
Washington Iron Works

GATHERING ARM

Jeffrey Mfg. Co., The
JOY MFG. CO.

RAIL (Mocking Machines)

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ATLAS COPCO, A. B., SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
BALDWIN-LIMA-HAMILTON CORP.
EIMCO CORP., THE
GARDNER-DENVER CO.
Salzgitter Maschinen Aktiengesellschaft

RUBBER-TIRED

ADAMS TRAVELOADER—SEE LE TOURNEAU-WESTINGHOUSE CO.
W. G. Allen & Sons, Ltd.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
American M.A.N. Corp.
AUSTIN-WESTERN—SEE BALDWIN-LIMA-HAMILTON CORP.
BARBER-GREENE CO.
Boydell, E. & Co. Ltd.
CLARK EQUIPMENT CO.
EUCLED DIVISION, GENERAL MOTORS CORP.
Hough—see International Harvester Export Co.
Hough Co., Frank G.
International Harvester Export Co.
Jaeger Machine Co., The
Jeffrey Mfg. Co., The
Carl Kaelble
Merton Engineering Co. Ltd.
LE TOURNEAU-WESTINGHOUSE CO.
MICHIGAN—SEE CLARK EQUIPMENT CO.
Minneapolis-Moline Co.
Mixermobile Mfg. Inc.
Moto-Loaders—see Thew Shovel
Napeo Industries, Inc.
Oliver Corp., The
Payloader—see Hough Co., The, Frank G.
Petitbone Mulliken Corp.
Quaker Pioneer Rubber Mills
Scopomobile—see Mixermobile Mfg. Inc.
Southwest Engineering Co.
Speedall—see Pettibone Mulliken Corp.
Thew Shovel Co.
Tracto-Loader—see Tractomotive Corp.
Tractomotive Corp.
"TRAVELOADER" — SEE LE TOURNEAU - WESTINGHOUSE CO.
Washington Iron Works
Westfall Equipment Company Inc.
Westinghouse Air Brake Co.

LOCOMOTIVES

BATTERY

ACEC
BALDWIN-LIMA-HAMILTON CORP.
English Electric Export & Trading Co., Ltd.
George Moss Pty. Ltd.
GENERAL ELECTRIC CO., INTERNATIONAL
G.E. Locomotive Div.
Goodman Mfg. Co.
Greensburg Machine Co.
International General Electric Co.
Jeffrey Manufacturing Co.
Mancha Storage Battery Locomotive Div., Goodman Mfg. Co.
THUNES MEK. VERKSTED, A. S.
Wood & Co. Ltd., Hugh
Wood & Sons Ltd., John

COMPRESSED AIR

Demag Aktiengesellschaft
Eimco Corp., The
HACK ENG. CO.
Mayo Tunnel & Mine Equip.
TRAMALIRE—SEE HACK ENG. CO.
International Dredge Mfg. Co.
Universal Tramair—see Universal Dredge Mfg.

DIESEL

ACEC
American Locomotive Co.
Fate-Root-Heath Co., The
General Electric Co.
GENERAL MOTORS OVERSEAS OPERATIONS
Goodman Mfg. Co., Mancha Div.
Greensburg Mach. Co.
Gregg Co., Ltd., The
HACK ENG. CO.
Humboldt, Klockner - Humboldt-Deutz AG
Hansa Engine Co., Ltd., The
INTERNATIONAL GENERAL ELECTRIC CO.
Klockner-Humboldt-Deutz, A. G.
LE TOURNEAU-WESTINGHOUSE CO.
Mancha Storage Battery Locomotive Div., Goodman Mfg. Co.
Mannesmann Export G.m.b.H.
Mayo Tunnel & Mine Equip.
Miller Machinery Co.
MIRRELES, BICKERTON & DAY, LTD.
Miscoula—see Miller Mach. Co.
MOTOR RAIL, LTD.
National Mine Service Co.
North British Locomotive Co.
Plymouth Locomotive Works
Rogers Iron Works Co.
Ruston & Hornsby, Ltd.
Ruth Co., The
SWITCHMOBILE—SEE LE TOURNEAU-WESTINGHOUSE CO.
TELLURIDE IRON WORKS CO.
THUNES MEK. VERKSTED, A. S.
Universal Dredge Mfg. Co.
UNIVERSAL—SEE HACK ENG. CO.
Vulcan Iron Works (Pa.)

DIESEL-ELECTRIC

Alco Products, Inc.
American Locomotive Co.
ATLAS CAR & MFG. CO., THE
Baldwin-Lima-Hamilton Corp., Eddystone Div.
Bron Boverie & Cie, A.G.
Differential Steel Car Co.
Fate-Root-Heath Co., The
General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
GENERAL MOTORS OVERSEAS OPERATIONS
Greensburg Machine Co.
HACK ENGINEERING CO.
International General Electric Co.
MIRRELES, BICKERTON & DAY, LTD.
North British Locomotive Co.
Plymouth—see Fate-Root-Heath Co., The
Plymouth Locomotive Works
Rogers Iron Works Co.
Ruston & Hornsby Ltd.
Universal Dredge Mfg. Co.
U.S. Industries, Inc.
Vulcan Iron Works (Pa.)

TROLLEY

ACEC
ASEA, SWEDEN
ATLAS CAR & MFG. CO., THE
Differential Steel Car Co.
General Electric Co., Apparatus Sales Div.
GENERAL ELECTRIC CO., INTERNATIONAL
Goodman Mfg. Co.
INTERNATIONAL GENERAL ELECTRIC CO.
INTERNATIONAL B. F. GOODRICH
Jeffrey Manufacturing Co.
NATIONAL MINE SERVICE CO.
THUNES MEK. VERKSTED, A. S.
Vulcan Iron Works (Pa.)
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

LOG WASHERS

See Washers

LUBRICANTS

Alennite—see Stewart Warner Corp.
Amalie—see Sonneborn Sons, Inc., L.
APS—see Jet-Lube Inc.
CR—see Jet-Lube Inc.
Caloi—see Standard Oil Co. of Calif.
Climax Molybdenum Co.
Dracolene—see Drullard Co., Howard
Esso Standard Oil Co.
Fiske Bros. Refining Co., Lubriplate Div.

Fluidwick Co.
General Petroleum Corp.
Gulf Oil Corp., Gulf Refining Co.
Houghton & Co., E. F.
Imperial Oil & Grease Co.
Jet-Lube Inc.
Keystone Lubricating Co.
Kopr-Kote—see Jet-Lube Inc.
Keystone Lubricating Co.
Lead-Cote—see Drullard Co.,
Howard
Lion Brand—see Monsanto Chemical Co.
Lubriplate—see Fiske Bros. Refining Co., Lubriplate Div.
Macmillan Petroleum Corp.
Molub-Alloy—see Imperial & Grease Co.
Monsanto Chemical Co.
Morocco—see Sahara Oil Co.
OG—see Jet-Lube Inc.
Perma-Film—see Jet-Lube Inc.
Perma-Wick—see Fluidwick Co.
Powertane—see Ideas Inc.
Roder-Blackburn Intl. Corp.
RPM—see Standard Oil Co., of Calif.
Sinclair Refining Co.
Socony-Vacuum Oil Co.
Sonneborn Sons, Inc., L.
Sta-put—see Houghton & Co., E. F.
Standard Oil Co. of California
Stewart Warner Corp.
Texas Co.
Thor Power Tool Co.
Tide Water Associated Oil Co.
Tycol—see Tide Water Associated Oil Co.
Union Oil of California
U. S. Graphite Co.
VL—see Jet-Lube Inc.
Wrighttube—see Wright Power Saw and Tool Corp.
Wright Power Saw and Tool Corp.

LUBRICATING SYSTEM

See also Oils, Air Line
Alemit—see Stewart-Warner Corp.
DRAVO CORP.
Farval Corp., The
Farval-Dualine—see Farval Corp., The
Hayl & Patterson, Inc.
Jet-Lube, Inc.
Lube-jet—see Trico Fuse Mfg. Co.
NORDBERG MFG. CO.
Stewart-Warner Corp.
Symons—see Nordberg Mfg. Co.
Trabon Engr. Co.
Trico Fuse Mfg. Co.

MACHINE SHOP EQUIPMENT

See Sharpeners

MAGNETIC EQUIPMENT

BRAKES

Eaton Mfg. Co., Dynamic Div.

DETECTORS

Fraser & Chalmers Eng. Works
Dings Magnetic Separator Co.

HEAD PULLEYS AND SUSPENSION MAGNETS

Davies Magnet Works Ltd.
Dings Magnetic Separator Co.
Eries Mfg. Co.
Fraser & Chalmers Eng. Works
Homer Mfg. Co., The
Humboldt, Klockner-Humboldt-Deuts., A. G.
Johnson, Herbert B.
Memco—see Magnetic Eng. & Mfg. Co.
Ohio Electric Mfg. Co.
Rapid Magnetic Machines, Ltd.
F. W. Shrader Co.
Scott's Concentrators
Stearns Magnetic Products Inc.
THUNES MEK. VERKSTED, A. S.

SEPARATORS

Carpco Mfg. Co.
Crucible Steel Co. of America
Davies Magnet Works Ltd.
Dings Magnetic Separator Co.

Engineers Syndicate, Ltd.
Eries Mfg. Co.
Exolon Co., The
Fraser & Chalmers Eng. Works
General Electric Co., Carboly Dept.
General Electric Co., Metallurgical Products Dept.
Homer Mfg. Co., The
Homer—see Homer Mfg. Div.
Humboldt, Klockner-Humboldt-Deuts., A. G.
Huntington, Heberlein & Co., Ltd.
Klockner-Humboldt-Deuts., A. G.
Jeffrey-Steffensen—see Jeffrey Mfg. Co., The
Jeffrey Manufacturing Co.
Johnson, Herbert Banks
Knapp & Bates, Ltd.
Krupp, Fried. Maschinen und Stahlbau Rheinhausen
Magnetic Engineering & Mfg. Co.
Memco—see Magnetic Engineering & Mfg. Co.
Sanford Day Iron Works, Inc.
Scott's Concentrators
Stearns Magnetic Products Inc.
THUNES MEK. VERKSTED, A. S.
WEDAG (Westfalia Dinnendahl Groppe AG)

MILL DESIGN

See Plant Design and Construction

MINE CARS

See Cars, Mine

MINE DOORS

See Doors, Mine

MINE SAFETY EQUIPMENT

See Safety Equipment

MONITORS (HYDRAULIC)

Chiksan Co.
Fraser & Chalmers Eng. Works
Hydraulic Supply Mfg. Co.
Intelli-Giant—see Chiksan Co.
Yuba Mining Div., Yuba.
Consolidated Industries, Inc.

MOTORS

See also Engines; Electrical Equipment; Locomotives

AIR MOTORS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Brown Boverie & Cie A. G.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co. Ltd.
Coppus Engineering Corp.
Demag Aktiengesellschaft
Emco Corp., The
GARDNER-DENVER CO.
GRAYBAR ELECTRIC CO., INC.
Holman Bros. Ltd.
Holman Brothers (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Ledern Mfg. Co.
MINE & SHELTER SUPPLY CO., THE MARCY MILL DIV.
PISTONAIR—SEE JOY MFG. CO.
H. K. PORTER CO., INC.
Salagitter Maschinen Aktiengesellschaft
Thor Power Tool Co.
TURBINAIR—SEE JOY MFG. CO.

Westinghouse Air Brakes Co. Le Roi Div.
WESTINGHOUSE ELEC. INTL. CO.

GEAR MOTORS

All-Motor—see Falk Corp., The
Allis Co., The Louis
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Brown Corp. (Sales) Ltd., David
BROWN, INC. DAVID
Christian Engineers, J. D.
Coeur d'Alene Hardware & Foundry Co.
Eaton Manufacturing Co., Dynamic Div.
Emco Corp., The
Fairbanks, Morse & Co.
Falk Corp., The
General Dynamics Corp., Electro Dynamic Div.
General Electric Co., Apparatus Sales Div.
General Motors Corp., Delco Products Div.
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
Hillman Co., Inc., C. Kirk
Howell Elec. Motors Co.
Ideal Electric & Mfg. Co.
International General Elec. Co.
Lima Electric Motor Co., The
LINE-BELT CO.
Master Electric Co., The
MINE & SHELTER SUPPLY CO., THE MARCY MILL DIV.
Motoreducers—see Falk Corp., The
Pacific Gear & Tool Works, Inc.
Philadelphia Gear Works, Inc.
Polyphase—General Motors Corp., Delco Products Div.
Reliance Electric & Engineering Co.
Rite-Lo-Speed—see Christian Engineers, J.D.
Sterling Electric Motors, Inc.
Syncoregear—see U.S. Electrical Motors, Inc.
U.S. Electrical Motors, Inc.
Wagner Electric Corp.
Western Gear Corp., (Lynwood)
Westinghouse Air Brakes Co., Cleveland Rock Drill Div.
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

HYDRAULIC MOTORS

American Brake Shoe Co.
Berry—see Oliver Iron & Steel Corp.
Oliver Iron & Steel Corp.

MUCKING MACHINES

See Loaders; Shaft Sinking Equipment

NODULIZING

See Palletizers and Nodulizers

NOZZLES

See Screens, Grizzlies and Accessories

OILERS, AIR LINE

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Black Widow—see Bean Rubber Mfg. Co.
Bohler Bros. & Co. Ltd.
CHICAGO PNEUMATIC TOOL CO.
Cleveland Vibrator Co.
Consolidated Pneumatic Tool Co., Ltd.
EIMCO CORP. THE
GARDNER-DENVER CO.
Holman Bros. Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Schramm, Inc.

STANDARD OIL CO. OF CALIF.
Stewart-Warner Corp.
Thor Power Tool Co.
Watts Regulator Co.
Westinghouse Air Brakes Co., Cleveland Rock Drill Div.
Westinghouse Air Brakes Co., Le Roi Div.
Wright Power Saw & Tool Corp.

OILS

See Lubricants; Reagents and Chemicals

OPEN GEARING

See also Gears

Brown Corp. (Sales) Ltd., David
Falk Corp., The
Farrel-Birmingham Co., Inc.
Western Gear Corp. (Calif.)

ORE TESTING SERVICES

ARIZONA TESTING LABORATORIES

Booth Co., Inc., The
Carpco Mfg. Inc.
DENVER EQUIPMENT CO.
Dunham Gordon Mfg. & Sales Co.
Fraser & Chalmers Eng. Works
Galigher Co., The
General Elec. Co., Ltd., The
Hanks, Inc., Abbott A.
Humboldt, Klockner-Humboldt-Deuts., A. G.
Johnson, Herbert Banks
Klockner-Humboldt-Deuts., A. G.
Knapp & Bates, Ltd.
Ledoux & Co.
McDowall Co., Inc. Dwight Lloyd Divn.
Mobile Drilling, Inc.
Nucleonic Corp. of America
Osborne Laboratories, Inc., Raymond G.
Rapid Magnetic Machines, Ltd.
SOUTHWESTERN ENGINEERING CO.
TELLURIDE IRON WORKS CO.
Tracerlab, Inc.
WESTERN MACHY CO.

OXYGEN BREATHING APPARATUS

See Safety Equipment

PACKING

Boston Woven Hose & Rubber Co.
Centipac—see Johns-Manville Sales Corp.
Chempak—see Johns-Manville Sales Corp.
Garlock Packing Co., The
GOODALL RUBBER CO.
Goodrich Co., B. F., Indus. Prod. Div.
Goodyear Tire & Rubber Co.
HEWITT-ROBINS, INC.
Houghton & Co., E. F.
INTERNATIONAL B. F. GOOD-RICH
Johns-Manville Sales Corp.
Kearsarge—see Johns-Manville Sales Corp.
Lee Rubber & Tire Corp., Republic Rubber Div.
Mogul—see Johns-Manville Sales Corp.
PORTER CO., INC., H. K. QUAKER RUBBER CO., DIV.
Quaker Pioneer Rubber Mills
QUAKER RUBBER CO.
Raybestos-Manhattan, Inc.
Republic Rubber Div., Lee Rubber & Tire Corp.
See Rings—see Johns-Manville Sales Corp.
Service—see Johns-Manville Sales Corp.
THERMOID CO.
Trim—see Houghton & Co., E. F.
United States Rubber Co.
U. S. Rubber Intl.
Vix-Syn—see Houghton & Co., E. F.

PELLETIZERS AND NODULIZERS

Allis-Chalmers Mfg. Co., Industries Group

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Pipe and Fittings

DRAVO CORP.
HARDING CO. INC.
Heyl & Patterson, Inc.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Koppers Co., Inc.
LINK-BELT CO.
Loesche, Germany
McDowell Co., Inc.
Surface Combustion Corp.

PIPE AND FITTINGS

See also Couplings

ASBESTOS

Air Cyl—see The Philip Carey Mfg. Co.
Armco Drainage & Metal Products, Inc.
Johns-Manville Sales Corp.
Pacific Pipe Co.
Perfecto—see The Philip Carey Mfg. Co.
Philip Carey Mfg. Co., The
Procto—see The Philip Carey Mfg. Co.
Superlight—see The Philip Carey Mfg. Co.
Tampahok—see The Philip Carey Mfg. Co.
Transite—see Johns-Manville

CAST AND STEEL

American Brake Shoe Co., Amer.
Manganese Steel Div.
American Locomotive Co.
Armco Drainage & Metal Products, Inc.
Atlas Copco Pacific, Inc.
Bethlehem Pacific Coast Steel Corp.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
CW—see National Supply Co., The
Calumet & Hecla, Inc., Calumet Div.
Crane Co.
ELECTRIC STEEL FOUNDRY CO.
G—see Grinnell Co., Inc.
HADFIELD LTD.
Kaiser Steel Corp.
Lead Lined Iron Pipe Co.
Mannesmann Export G.m.b.H.
McNally Pittsburgh Co.
Michigan Pipe Co.
Mills Iron Works, Inc.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NATIONAL IRON CO.
National Supply Co., The
PACIFIC PIPE CO.
Republic Steel Corp.
SPANG—see NATIONAL SUPPLY CO., THE
Taylor Forge & Pipe Works
UNITED STATES STEEL CORP.
UNITED STATES STEEL CORP., COLUMBIA GENEVA DIV.
UNITED STATES STEEL EXPORT CO.
Victaulic Co. of America
Walworth Co.
Western Foundry Co.
Youngstown Sheet & Tube Co., The

COPPER, BRASS AND BRONZE

Ameco Metal, Inc.
ANACONDA WIRE AND CABLE CO.
Birkett, Billings & Newton, Ltd.
Bridgeport Brass Co.
Chase Brass & Copper Co.
Crane Co.
G—see Grinnell Co., Inc.
Grinnell Co., Inc.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
PACIFIC PIPE CO.
Phelps Dodge Copper Prod. Corp.
Revere Copper & Brass Inc.
Walworth Co.

PLASTIC

Amercoat Corp.
Carlson Products Corp.
Clearstream—see Yardley Plastics Co.
Colonial Plastic Mfg. Co.
Crane Co.
Federal Pipe & Tank Company
GOODALL RUBBER CO.
Goodrich Co., B. F., Industrial Prod. Div.
Grinnell Co., Inc.
INTERNATIONAL B. F. GOOD-RICH CORP.
Korcmeal—see International B. F. Goodrich
Kraley Plastic Pipe Co., Inc.
Michigan Pipe Co.

Minnesota Mining & Mfg. Co.
Irvington Varnish & Insulator, a Div.
NATIONAL TANK & PIPE CO.
Pacific Pipe Co.
H. K. PORTER CO., INC.
Quaker Pioneer Rubber Mills
Republic Steel Corp.
Everson & Son, Inc., Joseph T.
Trabon Eng. Co.
United States Rubber Co.
U. S. STEEL CORP., COLUMBIA-GENEVA DIV.
UNITED STATES STEEL CORP.
UNITED STATES STEEL EXPORT CO.
Van-Cor—see Colonial Plastics Mfg. Co.
The Co.
Victaulic Co. of America
Walworth Co.
Yardley Plastics Co.
Youngstown Sheet & Tube Co., The

RUBBER LINED

Crane Co.
GOODALL RUBBER CO.
Goodrich Co., B. F., Industrial Prod. Div.
INTERNATIONAL B. F. GOOD-RICH CORP.
Michigan Pipe Co.
NAYLOR PIPE CO.
PACIFIC PIPE CO.
H. K. PORTER CO., INC.
Quaker Pioneer Rubber Mills
Raybestos-Manhattan, Inc.
THERMOID CO.
U. S. RUBBER CO.
Wilkinson Rubber Linatex, Ltd.

STEEL, SPIRAL-WELDED

A. B. Alvenius Industrier
Armco Drainage & Metal Products, Inc.
ARMCO STEEL CORP.
Hydraulic Supply Mfg. Co.
Lead Lined Iron Pipe Co.
NAYLOR PIPE CO.
PACIFIC PIPE CO.
Taylor Forge & Pipe Wks.

VALVES—see VALVES

WOOD

FEDERAL PIPE & TANK CO.
Michigan Pipe Co.
NATIONAL TANK & PIPE CO.
PACIFIC PIPE CO.
SANTA FE TANK DIV., FLOUR PRODUCTS CO.
Stuphen, Peter O.

PLANT DESIGN AND CONSTRUCTION

Allen and Garcia Co.
BALDWIN-LIMA-HAMILTON CORP.
BARBER-GREENE CO.
Baukol, Philip J.
Booth Co., Inc., The
Braun & Co., C. F.
Carpeo Mfg. Inc.
CHAPMAN AND WOOD
Continental Gin Co.
COWIN & CO., INC.
Davison & Co., (Hexham) Ltd.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Dorr- Oliver G.m.b.H.
DRAVO CORP.
Fisher Contracting Co.
EIMCO CORP., THE
Foster Wheeler Corp.
Fraser & Chalmers Eng. Works.
Frey Design—see Koppers Co., Inc.
Galigher Co.
Johnson & Phillips, Ltd.
Kaiser Engineers
Wharton Engineers, Ltd.
GOULD & CO., GORDON I. HACK ENGINEERING CO.
HEWITT-ROBINS INC.
Heyl & Patterson, Inc.
Humboldt, Klockner-Humboldt-Deuts. A. G.
Kaiser Engineers
KENNEDY-VAN SAUN MFG. ENG. CORP.
Klockner-Humboldt-Deuts. A. G.
Knapp & Bates, Ltd.
Koppers Co., Inc.
LINK-BELT CO.
Lints, Mark
Loesche, Germany
LOWEY-HYDROPRESS—SEE BALDWIN-LIMA-HAMILTON CORP.
LONGYEAR CO., E. J.

LURGI-GEIS. FUR CHEMIE & HUETTENWESEN G.m.b.H.
MACE CO., THE
Mayo Tunnel & Mine Equip.
McDowell Co., Inc.
Menlo Research Lab.
Minerals et Metaux
NATIONAL IRON CO.
Smith Engineering & Research Co.
Osborne Laboratories Inc., Raymond G.
Osmose Wood Preserving Co. of America, Inc.
Pioneer Eng. Div., Poor & Co., Inc.
Roberts & Schaefer Co.
Smith Engineering Works
Snell Inc., Foster D.
SOUTHWESTERN ENGINEERING CO.
STANDARD STEEL CORP.
STEARNS-ROGER MFG. CO.
STILL & STILL
TELLURIDE IRON WORKS CO.
Timber Engineering Co.
TREADWELL CO., INC., M. H.
U. S. Steel Corp., American Bridge Div.
Universal Dredge Mfg. Co.
Walvoord, Inc., O.W.
West Chester Chemical Co.
Western Knapp Engineering Co.
WESTERN MACH. CO.
Wilmet Eng. Co.
WISSER & COX
World Mining Consultants, Inc.
Yuba Consolidated Industries, Inc.

PNEUMATIC CONCRETING PLACING

Air Placement Equip. Co.
Bondactor—see Air Placement Equip. Co.
CEMENT GUN CO.
The Cementation Corp.
Construction Machinery Co.
EIMCO CORP., THE
Grout-or-Blast—see Air Placement Equip. Co.
GUNIT—SEE CEMENT GUN CO.
Mayo Tunnel & Mine Equipment
Mix-levator—see Air Placement Equip. Co.
Nucrotor—see Air Placement Equip. Co.
Torkret G.m.b.H.

PNEUMATIC TOOLS

See Tools, Air Driven

POSTS

See Arms and Posts

POWDER

See Blasting Supplies

PRESERVATIVES

See Reagents and Chemicals

PROSPECTING EQUIPMENT

See Exploration Equipment

PULLEYS

See also Magnetic Equipment
American Brake Shoe Co., Amer.
Manganese Steel Div.
AMPCO—SEE AMERICAN BRAKE SHOE CO.
Bonded Scale & Machine Co.
Chain Belt Co.
Continental Gin Co., Stephens-Crown—see
Adamson Mfg. Co.
Dings Magnetic Separator Co.
Dodge Mfg. Co.
Eberhard Bauer, G.m.b.H.
General Motors Corp., New Departure Div.
HEWITT-ROBINS, INC.
Humboldt, Klockner - Humboldt-Deuts. A. G.
Internaldine—see Yuba Mfg. Co.
Jeffrey Manufacturing Co.
John Wood & Sons, Ltd.

LINK-BELT CO.
Lippmann Engineering Works
Magnetic Eng. & Mfg. Co.
National Iron Co.
Reeves Pulley Co.
Rex—see Chain Belt Co.
Sanford-Day-iron Works Inc.
SPOOKUM CO., INC. THE
STEPHENS-ADAMSON MFG. CO.
TELLURIDE IRON WORKS CO.
Texas Gulf Sulphur Co.
Wedg-Gripp—see Christian Engineers, J.D.
Western Foundry Co.
Western Gear Works
Worthington Corp.
Yuba Mining Co.

PULVERIZERS

See also Crushers; Grinding Equipment; Laboratory Supplies
Combustion Engineering Inc. (Raymond Div.)
DENVER FIRE CLAY CO.
Foster Wheeler Corp.
Humboldt, Klockner - Humboldt-Deuts AG
International Combustion Products Ltd.
Jeffrey Mfg. Co., The
Kenec
Loesche Harzerkleinzerungs und Zement-maschinen ("Loesche Mills")
STURTEVANT MILL CO.
WEDAG (Westfalia Dinnendahl Groppe AG)

PUMPS

ACID

ALLEN-SHERMAN-HOFF PUMP CO., THE
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
American Brake Shoe Co., Amer.
Manganese Steel Div.
Amag-Hilpert-Pegnitzhutte A. G.
AMPCO Metal, Inc.
Ameco Centrifugal Pumps — see Ameco Metal, Inc.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Apco—see New York Air Brake Co., The, Aurora Pump Div.
Aurora—see New York Air Brake Co., The, Aurora Pump Div.
Barrett, Haentjens & Co.
Bellis & Marcom, Ltd.
Buck & Associates, Carl
Byron Jackson Pumps, Inc.
Camac—see Carl Buck & Associates
CENTRISEAL—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
DORR-OLIVER, INC.
Dorr- Oliver G.m.b.H.
Duriron Co., Inc., The
ELECTRIC STEEL FOUNDRY CO.
Fairbanks, Morse & Co.
Foots Machinery & Chemical Corp.
Peerless Pump Div.
Fraser & Chalmers Eng. Works
Galigher Co., The
Galigher Sump Pump—see Galigher Co., The
GARDNER-DENVER CO.
Hayward Tyler & Co., Ltd.
HAZELTON—SEE BARRETT, HAENTJENS & CO.
HYDROSEAL—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
INGERSOLL-RAND CO.
International Combustion, Ltd.
Jaeger Machine Co., The
Knapp & Bates Ltd.
LaBour Co.
Mannesmann Export G.m.b.H.
Marlow Pumps—Div. of Bell & Gossett Co.
Mather & Platt Ltd.
Maynard—see Robbins & Myers, Inc.
NAGLE PUMPS, INC.
New York Air Brake Co., The, Aurora Pump Div.
OLIVITE—SEE DORR-OLIVER, INC.
Peerless Pumps, Inc.
Robbins & Myers, Inc.
Hayward Tyler & Co., The
Vacsual—see Galigher Co., The
Vacsual—see International Combustion Ltd.
WESTERN MACH. CO.
WILFLEY & SONS, INC., A. R.
Wilkinson Rubber Linatex, Ltd.
Worthington Corp.

AIR-DRIVEN

ATLAS COPCO AB, SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Barrett, Haentjens & Co.
Blagdon-Durham, Ltd.
Bryon Jackson Pumps, Inc.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Haselton-see Barrett, Haentjens & Co.
Holman Bros., Ltd.
INGERSOLL-RAND CO.
Krogh Pump Co. LaBour Co., Inc.
Leden Mfg. Co.
Mannesmann Export G.m.b.H.
Schramm, Inc.
Stewart-Warner Corp.
Thor Power Tool Co.
Westinghouse Air Brake Co., La Roi Div.

FILTRATE

Barrett, Haentjens & Co.

LINERS

Ruhrkumstaft G.m.b.H.

MINE AND DEEP WELL

ACEC
ALLIS-CHALMERS MFG. CO.
INDUSTRIES GROUP
Amag-Hilpert-Pegnitzhutte A.G.
American Brake Shoe Co., Amer. Manganese Steel Div.
American M.A.N. Corp.
AMSCO-SEE AMERICAN BRAKE SHOE CO.
Aurora-see New York Air Brake Co., The, Aurora Pump Div.
Barrett, Haentjens & Co.
Blagdon Durham Ltd.
Brownie-see Sanford Day Iron Works, Inc.
Bryon Jackson Pumps, Inc.
CHICAGO PNEUMATIC TOOL CO.
Cresluis Company, Ltd.
Fairbanks Morse Co.
FLYGT-SEE STANCO MFGS. & SALES, INC. AND STENBERG MFG. CORP. OF CANADA LTD.
GARDNER-DENVER CO.
Hayward Tyler Co., Ltd.
Haselton & Pleuger-see Barrett, Haentjens & Co.
INGERSOLL-RAND CO.
Jaeger Machine Co., The
Johnston Pump Co.
La Bour Co., Inc., The
Mannesmann Export G.m.b.H.
Mather & Platt Ltd.
Moyno-see Robbins & Myers, Inc.
National Supply Co. (Pa.)
New York Air Brake Co., The
Aurora Pump Div.
Peerless Pump Div.
Pegson Ltd.
Pleuger, Unterwasserpumpen Pumps, Inc.
Rice Pump & Mach. Co.
Robbins & Myers, Inc.
Salzgitter Maschinen Aktiengesellschaft
Sanford Day Iron Works
STANCO MFG. & SALES, INC.
Standard Elec. Mfg. Co., Inc.
Stenberg Corporation A/B
Stenberg Corp. of Canada Ltd.
Svenska Motorbör AB
Hayward Tyler & Co.
Turbo-Maschinen A.G.
Wedag A.G.
Worthington Corp.

SAND AND SLIME

ACEC
ALLEN-SHERMAN-HOFF PUMP CO., THE
ALLIS-CHALMERS MFG. CO.
INDUSTRIES GROUP
Amag-Hilpert-Pegnitzhutte A.G.
American Brake Shoe Co., Amer. Manganese Steel Div.
American M.A.N. Corp.
AMSCO-SEE AMERICAN BRAKE SHOE CO.
Aveling-Barford, Ltd.
Barrett, Haentjens & Co.
CARPCO MFG. INC.
CENTRISEAL-SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Dorr-Oliver G.m.b.H.

Erie-see Erie Pump & Engine Works
Erie Pump & Engine Works
Flyst-see Stenberg Corp. of Canada Ltd.
Food Machinery & Chemical Corp.
Peerless Pump Div.
Fraser & Chalmers Eng. Wks.
Gallagher Co., The
Gallagher Sump Pump-see Gallagher Co., The
Gardner-Denver Co.
General Electric Co. Ltd., The
Haselton-see Barrett, Haentjens & Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
HYDROSEAL-SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
International Combustion Ltd.
Jaeger Machine Co., The
Johnston Pump Co.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates Ltd.
Lightning Pumps-see Kansas City Hay Press Co.
Linatex Corp. of America
Morris Machine Works
Morse Bros. Machinery Co.
Moyno-see Robbins & Myers, Inc.
NAGLE PUMPS, INC.
O.D.S.-SEE DORR-OLIVER, INC.
Peerless Pumps, Inc.
Petitbone-Mulliken Corp.
Pleuger, Unterwasserpumpen
Rice Pump & Machine Co.
Robbins & Myers, Inc.
SPANG & CO.
Stenberg Corp. of Canada Ltd.
Swett Iron Works, A. L.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
Thor Power Tool Co.
Vessel-see Gallagher Co., The
Vessel-see International Combustion Ltd.
WEDAG (Westfalla Dinnendahl Groppe AG)
WEMCO-SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.
WILFLEY & SONS INC., A. R.
Wilkinson Linatex Ltd. of Canada
Worthington Corp.
Yuba Manufacturing Div. Yuba Consolidated Industries, Inc.

VACUUM

ALLIS-CHALMERS MFG. CO.
INDUSTRIES GROUP
Anco-see Central Scientific Co. of Calif.
Barrett-Haentjens & Co.
Braun-Knecht-Heimann
Central Scientific Co. of Calif.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
DORR-OLIVER, INC.
GARDNER-DENVER CO.
Haselton-see Barrett, Haentjens & Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
INGERSOLL-RAND CO.
International Combustion Co.
JOY MFG. CO.
Mannesmann Export G.m.b.H.
OLIVER-SEE DORR-OLIVER, INC.
Peters Filters & Eng. Co.
Roots-Connorsville Blower
Texas Gulf Sulphur Co.
THUNES MEK. VERKSTED, A. S.
WEDAG (Westfalla Dinnendahl Groppe AG)
Worthington Corp.

PYRO-**METALLURGICAL EQUIPMENT**

See also Laboratory Equipment and Supplies; Sintering Machines; Dryers and Kilns

CONVERTERS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

Dorr-Oliver G.m.b.H.
Fraser & Chalmers Eng. Works
General Electric Co., Apparatus Sales Div.
Humboldt, Klockner-Humboldt-Deutz, A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
TREADWELL CO., INC., M. H.

CUPPELLING FURNACES

MACE CO., THE

REVERBERATORY FURNACES

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
DENVER FIRE CLAY CO., THE
Hevi-Duty Electric Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
Klockner-Humboldt-Deutz, A. G.
MACE CO., THE
TREADWELL CO., INC., M. H.
U. S. Smelting Furnace Co.

ROASTING FURNACES

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO., THE
DORR-OLIVER, INC.
Dorr-Oliver G.m.b.H.
DORR-OLIVER-SEE DORR-OLIVER, INC.
GOULD & CO., GORDON I.
HARDINGE CO., INC.
Hartwig, Walter
Hevi-Duty Electric Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
Huntington, Heberlein & Co., Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
MACE CO., THE
MINE & SMELTER SUPPLY CO.
Nichols Engineering & Research Corp.
Nichols Herreschoff-see Nichols Engineering & Research Corp.
PACIFIC FOUNDRY CO., LTD.
Perry-see Silver Eng. Co.
Pollock Co., The William B.
Silver Engineering Co.
SKINNER-SEE MINE & SMELTER SUPPLY CO.
STEARNES-ROGER MFG. CO.
Surface Combustion Corp.
TRAYLOR ENGR. & MFG. CO.
TREADWELL CO., INC., M. H.
U. S. Smelting Furnace Co.
Westinghouse Electric Corp.

SMELTING FURNACES

ACEC
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Demag-Elektrometallurgie G.m.b.H.
Elektronkemik A.S.
Elken-see Elektrokemik A.S.
Fraser & Chalmers Eng. Works
HEROULT ELECTRIC FURNACE-SEE U.S. STEEL EXPORT CO.
Hevi-Duty Electric Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
Huntington, Heberlein & Co., Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Lectromelt Furnace Co.
MACE CO., THE
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Pollock Co., The William B.
Soderbert Electrodes-see Elektrokemik A.S.
TRAYLOR ENGR. & MFG. CO.
TREADWELL CO., INC., M. H.
Tyaland-Hole-see Elektrokemik A.S.
U. S. Smelting Furnace Co.
UNITED STATES STEEL EXPORT CO.
Westinghouse Electric Co.

RADIO SYSTEMS

See Communications

RAIL, MINE

See Track and Accessories

REAGENTS AND CHEMICALS

See also Laboratory Equipment and Supplies

CHEMICALS AND SERVICE

Crown Zellerbach Corp.
Halliburton Oil Well Cementing Co.
Pacific Lumber Co., The
Palcotan & Falconate-see Pacific Lumber Co., The
Weston Chemical Co.

CYANIDE

Allied Chemical & Dye Corp., General Chemical Div.
AMERICAN CYANAMID COMPANY MINERAL DRESSING DEPT.
Braun-Knecht-Heimann Co.
DENVER FIRE CLAY CO.
du Pont de Nemours & Co., E. I.
Electrochemicals Dept.
Van Waters & Rogers, Inc.
Walker Machinery Co.

FERROSILICON

KNAPSACK-GRIESHEIM A.G., DIV. OF FAHRWERKE
HOECHST A.G.
PROGRESSIVE COLOR & CHEMICAL CO., INC.-SEE KNAPSACK-GRIESHEIM A.G.

FLOCCULENTS

Acrysol CA-see Rohm & Haas Co.
Acrysol CQ-see Rohm & Haas Co.
Allied Chemical & Dye Corp., General Chem. Div.
Cesalpinia s.p.a.
Consolidated Chemical Industries
Crown Zellerbach Corp.
Flocal-see Cesalpinia s.p.a.
General Mills, Inc., Special Commodities Div.
Guartec-see General Mills, Inc.
Philadelphia Quarts Co.
Stauffer Chemical Co.
Walker Machinery Co.
Weston Chemical Co.

FLOTATION REAGENTS

Alamacs, Alamines-see General Mills Inc., Chem Div.
Allied Chem. & Dye Corp., Barrett Div. American Agricultural Chem. Corp.
AMERICAN CYANAMID COMPANY MINERAL DRESSING DEPT.
Armacs-see Armour Chemical Division
Armour Chemical Division
ATLAS POWDER CO.
Braun Chemical Co.
Braun-Knecht-Heimann Co.
Consolidated Chemical Industries
Crown Zellerbach Corp.
DENVER FIRE CLAY CO.
Dow Chemical Co., The
Du Pont de Nemours & Co., Inc., Chemical Div.
Emery Industries, Inc.
FARBENKE HOECHST A.G.
General Mills, Inc., Chemical Div.
General Mills, Inc., Special Commodities Div.
HERCULES POWDER CO.
Koppers Co., Inc.
Metco-see Philadelphia Quarts Co.
Monamit, Monamine, Monapon, Monaterre, Monawet-see Mons Industries, Inc.
Monsanto Chem. Co.
Newport Industries Co.
Orsan-see Crown Zellerbach Corp.
PQ-see Philadelphia Quarts Co.
Pacific Lumber Co., The
Palcotan & Falconate-see Pacific Lumber Co., The
PENNSALT CHEMICALS CORP.
Pentacel-see Sharples Chemicals Inc.
Petrodote-see Sonneborn Sons, Inc., I.
Philadelphia Quarts Co.
Primene SI-R-see Rohm & Haas Co.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Recorders

Primene JM-T—see Rohm & Haas Co.
 Reilly Tar & Chemical Corp.
 Rohm & Haas Co.
 Sharples Chemicals Inc.
 Sonneborn Sons, Inc., L.
 Standard Oil Co. of Calif.
 Stauffer Chemical Co.
 Swift & Co. Technical Prod. Plant
 UNITED STATES STEEL CORP.
 Van Waters & Rogers Inc.
 Walker Machinery Co.
 WEDAG (Westfalia Dinnerdahl Groppe AG)
 Weston Chemical Co.

Ion Exchange Resins

INFILCO, INC.
 Permutit Co., The
 Peterson Filter & Engineering Co.
 Rohm & Haas Co.

PRESERVATIVES, TIMBER

Allied Chemical & Dye Corp., Barrett Div.
 DOW CHEMICAL CO., THE
 Du Pont de Nemours & Co. Inc., Chemical Div.
 General Petroleum Corp.
 Koppers Co., Inc., Wood Preserving Div.
 Lerlab Supply Co.
 M-T-M, Osmosalts, Osmoplastia, Penox—see Osmose Wood Preserving Co.
 Mersolites-Berk & Co., Inc.
 Monsanto Chemical Co.
 Osmoplastia & Osmosalts—see Osmose Wood Preserving Co. of America, Inc.
 Osmose Wood Preserving Co. of America, Inc.
 Philadelphia Quartz Co.
 Reilly Tar & Chemical Corp.
 Standard Oil Co. of Calif.
 U. S. STEEL CORP.
 Van Waters & Rogers, Inc.
 Wolman—see Koppers Co., Inc., Wood Preserving Div.
 AMERICAN CYANAMID CO.
 DOW CHEMICAL CO.

ROADBINDERS

Crown Zellerbach Corp.
 Pacific Lumber Co., The
 Palcotan & Palcotan—see Pacific Lumber Co., The

SEQUESTERING

Crown Zellerbach Corp.
 Halliburton Oil Well Cementing Co.
 Weston Chemical Co.

XANTHATES

Walker Machinery Co.

OTHER ACIDS AND CHEMICALS

Allied Chem. & Dye Corp., Barrett Div.
 Allied Chemical & Dye Corp., General Chemical Div.
 AMERICAN CYANAMID COMPANY—MINERAL DRESSING DEPT.
 AMERICAN POTASH & CHEMICAL CORP.
 Amine Liquid Extracts—see Rohm & Haas Co.
 Apache Powder Co.
 Armour Chemical Division
 ATLAS POWDER CO.
 Braun Chemical Co.
 Braun Corp.
 Braun-Knecht-Heimann Co.
 Central Scientific Co. of Calif.
 Consolidated Chemical Industries
 Crown Zellerbach Corp.
 DENVER FIRE CLAY CO.
 DOW CHEMICAL CO., THE
 du Pont de Nemours & Co., E. I. Chemicals Dept.
 Emery Industries, Inc.
 Food Machinery & Chemical Corp., Westvaco Chemical Div.
 General Mills, Inc., Chemical Div.
 HERCULES POWDER CO.
 Johnson March Corp.
 Lerlab Supply Co.
 Memo Research Lab.
 Merck & Co.
 Minerec Corp.
 Monsanto Chemical Co.
 Nucleonic Corp. of America
 ORZAN—see Crown Zellerbach Corp.
 PENNSALT CHEMICALS CORP.
 Phelps Dodge Refining Corp.
 Philadelphia Quartz Co.
 Reilly Tar & Chem. Corp.
 Rohm & Haas Co.
 Sharples Chemicals Inc.

Stauffer Chemical Co., Consolidated Chem. Ind. Div.
 Swift & Co. Technical Prod. Plant
 Union Carbide and Carbon Corp.
 UNITED STATES STEEL CORP.
 Van Waters & Rogers, Inc.
 Walker Machinery Co.
 West Chester Chem. Co.
 Weston Chemical Co.
 Westvaco-Chlor-Alkali Div., Food Mach. & Chem. Corp.

RECORDERS

ELECTRICAL

ABCs Scale Div., The McDowell Co.
 ACEC
 Electronix—see Minneapolis-Honeywell Regulator Co.
 The Esterline-Angus Co., Inc.
 Fischer & Porter Co.
 Foxboro Co., The
 General Electric Co., Apparatus Sales Div.
 INFILCO, INC.
 Leeds & Northrop Co.
 LOGAN ENGE. CO.
 Mine Safety Appliances Co.
 Minneapolis-Honeywell-Heiland Div.
 Minneapolis-Honeywell Regulator Co.
 Nucleonic Corp. of America
 Westinghouse Electric Corp.
 Weston Instruments (Div. of Daystrom, Inc.)
 Wheelco, Instruments Div., Barber-Colman Co.

MECHANICAL

ABCs Scale Div., The McDowell Co.
 Bristol Co., The
 Douglas & Gierans
 Foxboro Co., The
 Nucleonic Corp. of America
 Penn Instrument Corp.
 Permutit Co., The

PNEUMATIC

ABCs Scale Div., The McDowell Co.
 English Drilling Equipment Co.
 Foxboro Co., The
 INFILCO, INC.

REDUCERS, SPEED

See Speed Changers

ACEC
 Brown Corp. (Sales) Ltd., David Humboldt, Klockner - Humboldt-Deuts AG

REFRACTORIES

Air Placement Equip. Co.
 Alfrax—see Carborundum Co., The
 Aluminum—see Norton Co.
 AMERICAN BRAKE SHOE CO.
 Astex—see Mexico Refractories Co.
 BABCOCK & WILCOX CO., THE
 Blazcrete—see Johns-Manville
 Carbofrax—see Carborundum Co., The
 Carborundum Co., The Refractories Div.
 Cryolon—see Norton Co.
 DFC—SEE DENVER FIRE CLAY CO., THE
 DENVER FIRE CLAY CO., THE
 Firecrete—see Johns-Manville
 General Refractories Co.
 Harbison-Walker Refractories Co.
 Jay Bee—see Mexico Refractories Co.
 Johns-Manville Sales Corp.
 Kaiser Aluminum & Chem. Corp.
 Mexico Refractories Co.
 Monofrax—see Carborundum Co., The
 Mullfrax—see Carborundum Co., The
 Nareo—see North Am. Refractories Co.
 North American Refractories Co.
 Norton Co.
 Refrax—see Carborundum Co., The
 Robinson Clay Product Co., The
 SPANG & CO.
 Utah Fire Clay Co.

RESPIRATORS

See Safety Equipment

ROASTING FURNACES

See Dryers and Kilns; Pyrometallurgical Equipment; Sintering Machines

ROCK BOLTS

See Bolts, Rock

ROD MILLS

See Grinding Equipment

RODS

See Grinding Equipment; Welding Equipment

ROLLS, ROLLERS

See Crushers; Conveyors

ROOF BOLTS

See Bolts, Rock

ROPE, WIRE, AND

ACCESSORIES

American Chain & Cable Company, Inc.
 American Chain & Cable Co., Inc.
 Hazard Wire Rope Div.
 American Chain & Cable Co., Inc.
 Wire Rope Div.
 American Hoist & Derrick Co., Crosby-Laughlin Div.
 Band-it Co.
 Bethlehem Pacific Coast Steel Corp.
 Bethlehem Steel Co.
 Bethlehem Steel Export Corp.
 British Rope Ltd.
 British Rope Engineering Co. Ltd.
 Broderick & Bascom Rope Co.
 Bullard Co., E. D.
 Bullard-Burnham—see Bullard Co., E. D.
 Canada Wire & Cable Co., Ltd.
 P. S. "B"
 Canton Mfg. Co.
 Carco—see Pacific Car & Foundry Co.
 COLEMAN CABLE & WIRE CO.
 COLORADO FUEL & IRON CORP.
 Crasline Company, Ltd.
 Crosby—see American Hoist & Derrick Co.
 Crucible Steel Co. of America
 E. H. Edwards Co.
 ELECTRIC STEEL FOUNDRY CO.
 Falling Co., Geo. F.
 GRAYBAR ELECTRIC CO., INC.
 GOODRICH CO., THE B. F.
 Gripshoit, Inc.
 Iron Grip—see Princeton Gripshoit Inc.
 Jones & Laughlin Steel Corp.
 JOY MFG. CO.
 Laughlin Co., The Thomas
 Laughlin-Crosby—see American Hoist & Derrick Co.
 LE TOURNEAU-WESTINGHOUSE CO.
 Leseben Wire Rope—see H. K. Porter Co., Inc.
 MacWhirte Co.
 Martin, Black & Co., (Wire Ropes) Ltd.
 Mill & Mine Supply, Inc.
 Okonite Co., The
 Pacific Car & Foundry Co.
 Pacific Wire Rope Co.
 H. K. Porter Co., Inc., Leschen Wire Rope Div.
 Princeton Gripshoit Inc.
 Punch-Lok Co.
 RIBLET TRAMWAY CO.
 Roder-Blackburn Intl. Corp.
 ROEBLING'S SONS CORP., JOHN
 Round Chain Co.
 Ryerson & Son, Inc., Joseph T.
 SAUERMAN BROS., INC.
 Svenska Motorbör A.G.
 Synflex—see Wall Rope Wks., Inc.
 TELLURIDE IRON WKS.
 TIGER BRAND—SEE U. S. STEEL EXP. CO.
 TOURNARPE—SEE LE TOURNEAU-WESTINGHOUSE CO.
 Uddeholms Aktiebolag

Union Wire Rope Corp.
 U. S. STEEL CORP.
 U.S.S.—Tiger Brand—SEE UNITED STATES STEEL CORP., COLUMBIA-GENEVA STEEL DIV.
 U. S. STEEL CORP., TENNESSEE COAL & IRON DIV.
 UNITED STATES STEEL CORP., COLUMBIA-GENEVA DIV.
 UNITED STATES STEEL EXPORT CO.
 Wall Rope Wks., Inc.
 Wireco—see Wire Rope Co. of Am. Inc.
 Wire Rope Corp., of America, Inc.
 WICKWIRE—SEE COLORADO FUEL & IRON CORP., THE

RUBBER PRODUCTS

See Bolts; Hoses; Conveyor Equipment; Safety Equipment

SAFETY EQUIPMENT

APPAREL

A & A Mfg. Co., Inc.
 Bausch & Lomb Optical Co.
 Bullard Co., E. D.
 Gardwell—see Safety Clothing & Equipment Co.
 GOODALL RUBBER CO.
 Industrial Air Products Co.
 INTERNATIONAL B. F. GOODRICH
 Johns-Manville Sales Corp.
 Lehigh Safety Shoe Co.
 Martindale Electric Co.
 Mine Safety Appliances Co.
 Parker Safety Equipment Co.
 Pulmonan Safety Equip. Corp.
 Ray-O-Vac Co., Div. of Electric Storage Battery Co.
 Safety Clothing & Equipment Co.
 Safety First Supply Co.
 Safety Products Ltd.
 Skulgard—see Mine Safety Appliances Co.
 Sly Mfg. Co., W. W.
 United States Rubber Co.
 Wil-Gard—see Wilson Rubber Co., The
 Wilson Rubber Co., The

FIRE-FIGHTING EQUIPMENT

American Rubber Mfg. Co.
 Badger Fire Extinguisher Co.
 Blackhawk Mfg. Co.
 Bullard Co., E. D.
 Four Wheel Drive Auto Co., The
 General Detroit Corp.
 General Fire Extinguisher Corp., The
 Goodrich Co., The B. F.
 Grinnell Co., Inc.
 Industrial Air Products Co.
 INTERNATIONAL B. F. GOODRICH
 Kidde & Co. Inc., Walter
 Lee Rubber & Tire Corp., Republic Rubber Div.
 Mine Safety Appliances Co.
 Pulmonan Safety Equipment Corp.
 Pyrene-C-O-Two
 Republic Rubber Div., Lee Rubber & Tire Corp.
 Safety Clothing & Equipment Co.
 Safety Fire Extinguisher Co.
 Safety First Supply Co.

GENERAL

Ampeco Metal, Inc.
 Atomic Engineering Corp.
 Bullard Co., E. D.
 Chicago Eye Shield Co.
 John Davis & Son, Ltd.
 Gardwell—see Safety Clothing & Equipment Co.
 Linde Air Products Co.
 Mine Safety Appliances Co.
 National First Aid Supply Co.
 Nucleonic Corp. of America
 Ohio Brass Co.
 Pulmonan Safety Equipment Corp.
 Ray-O-Vac Co.
 Rose Mfg. Co.
 Safe-Hi—see Rose Mfg. Co.
 Safety Clothing & Equipment Co.
 Safety First Supply Co.
 Wilson Products Div., Ray-O-Vac Co.

LIGHTS

ACEC
 A & A Mfg. Co.
 John Davis & Son, Ltd.
 Edison—see Mine Safety Appliances Co.
 ELECTRIC STORAGE BATTERY CO., THE, EXIDE IND. DIV.
 General Electric Co., Lamp Div.

GRAYBAR ELECTRIC CO., INC.
Homelite Corp.
Justite Mfg. Co.
Martindale Electric Co.
Mine Safety Appliances Co.
National Mine Service Co.
Oldham & Son, Ltd.
Ray-O-Vac Co.
Safety First Supply Co.
United States Electric Mfg. Corp.
Westinghouse Electric Corp.
Westinghouse Electric Corp., Cleveland Div.
Wheat—see National Mine Service Co.
Wolf Safety Lamp Co. of America, Inc.

RESPIRATORS

Bullard Co., E.D.
Chicago Eye Shield Co.
Comfo—see Mine Safety Appliances Co.
Dustfree—see Mine Safety Appliances Co.
Industrial Air Prods. Co.
Linde Air Prod. Co.
Martindale Electric Co.
Mine Safety Appliances Co.
Pulmonom Safety Equip. Corp.
Ray-O-Vac Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Super-Tough—see Wilson Prod., Inc.
Wilson Prod. Div., Ray-O-Vac Co.

SELF CONTAINED OXYGEN

Bullard Co., E.D.
Chemox—see Mine Safety Appliances Co.
Industrial Air Products Co.
Linde Air Prod. Co.
Mine Safety Appliances Co.
Safety First Supply Co.

SAMPLERS

ACKER DRILL CO., INC.
Agence Miniere Et Maritime, S. A.
Carpco Mfg. Inc.
Carrier Conveyor Corp.
Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
DICKINSON LABORATORIES, INC.
Ducon Co.
Fraser & Chalmers Eng. Works
Galigher Co., The
Galigher Junior—see Galigher Co., The
Gary-Jennings—see Galigher Co., The
Hanks, Inc., Abbott A.
HARDING CO., INC.
Heyl & Partners, Inc.
Holman Bros. Ltd.
Humboldt, Klockner - Humboldt-Deuts AG
INFILCO, INC.
International Combustion Ltd.
JONES—SEE DENVER FIRE CLAY CO.
Klockner-Humboldt-Deuts. A. G.
Knapp & Bates Ltd.
Ledoux & Co.
LONGYEAR CO. E. J.
McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO.
Mine Safety Appliances Co.
Minerapac Metals
Mobile Drilling Inc.
Nucleonic Corp. of America
Penn-drill—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.
Scott's Concentrators
Sepor Microsplitter Supply
Smith-Emery Co.
SPRAGUE & HENWOOD, INC.
Staplex Co., The
STURTEVANT MILL CO.
TELLURIDE IRON WORKS CO.
TRAYLOR ENGR. & MFG. CO.
VEZIN—SEE MINE & SMELTER SUPPLY CO.
WEDAG (Westfalia Dinnendahl Groppe AG)

SAWS, POWER

See also Tools, Air Driven

CHAIN SAWS

Andreas Stihl Maschinenfabrik
Consolidated Pneumatic Tool Co., Ltd.
Dolmar Maschinen Fabrik
GRAYBAR ELECTRIC CO., INC.
Homelite Div., Textron, Inc.
Mill & Mine Supply, Inc.
PORTO-CUT—SEE VULCAN IRON WORKS, DENVER, COLO.

Titan—see Mill & Mine Supply, Inc.
VULCAN IRON WORKS (DENVER)
Wright Power Saw and Tool Corp.

FRAMING SAWS

DENVER EQUIPMENT CO.
STEARNS ROGER MFG. CO.

POWERED HAND SAWS

Andreas Stihl Maschinenfabrik
ATLAS CONCO AB, SWEDEN
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
GRAYBAR ELECTRIC CO., INC.
Holman Bros. Ltd.
INGERSOLL-RAND CO.
Syntron Co.
Thor Power Tool Co.
VULCAN-DENVER-VULCAN IRON WORKS
Wright Power Saw & Tool Corp.

SCALES**AUTOMATIC WEIGHING AND BELT SCALES**

ABCs Scale Division, McDowell Co., Inc.
BALDWIN-LIMA-HAMILTON CORP.
Con-O-Weigh, see Industrial Physics & Electronics Co.
Fairbanks, Morse & Co.
Howe Scale Co., The
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Koehring Co., Johnson Co., C. S.
McDowell Co., Inc., The
Merrick Scale Mfg. Co.
Poidometer—see Schaffer Poidometer Co.
Richardson Scale Co.
Schaffer Poidometer Co.
St. Regis Paper Co.
Toledo Scale Co.
Transportometer—see McDowell Co., Inc., The
Weightometer—see Merrick Scale Mfg. Co.

TRUCK AND RAILROAD SCALES

Fairbanks, Morse & Co.
Howe Scale Co., The
INDUSTRIAL PHYSICS & ELECTRONICS CO.
Richardson Scale Co.
Toledo Scale Co.

SCRAPERS

See also Excavators; Tractors and Attachments

Allis-Chalmers Mfg. Co., Const. Machy. Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ALLOY STEEL & METALS CO.
American Brake Shoe Co., Amer. Manganese Steel Div.
American Tractor Equipment Corp.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BALDWIN-LIMA-HAMILTON CORP.
British Ropeway Eng. Corp.
Brown Corp. (Sales) Ltd., David CW—SEE CURTISS-WRIGHT CORP., SOUTH BEND DIV.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONST. MACHY. DIV.
COLUMBIA STEEL CASTING CO., INC.
CRESCENT — SEE SAUER-MAAN BROS., INC.
CURTIS-WRIGHT CORP., SOUTH BEND DIV.
Demag Aktiengesellschaft
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
EUCLID DIV., GENERAL MOTORS CORP.
GENERAL MOTORS CORP. EUCLID DIV.
GENERAL MOTORS OVERSEAS OPERATIONS
Holman Bros. Ltd.
International Combustion Ltd.

INTERNATIONAL HARVESTER CO.
JOY MANUFACTURING CO.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE CO.
MICHIGAN—SEE CLARK EQUIPMENT CO.
M-R-S Manufacturing Co.
PACIFIC—SEE ALLOY STEEL & METALS CO.
Salzgitter Maschinen Aktiengesellschaft
Pacific Car & Foundry Co.
SAUERMAN BROS., INC.
Terra Clipper—see Wooldridge Mfg. Co.
August Thiele G.m.b.H.
Thompson-Berg Company
VICKERS-ARMSTRONGS (TRACTORS) LTD.
VULCAN DENVER—SEE VULCAN IRON WORKS, DENVER, COLO.
VULCAN IRON WORKS (DENVER)
Westinghouse Air Brake Co. (Pa.)
WESTINGHOUSE CO., LE TOURNEAU

SCREENS, GRIZZLIES, AND ACCESSORIES**REVOLVING SCREENS**

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
American Brake Shoe Co., American Manganese Steel Div.
Aveling-Barford, Ltd.
Cleveland Wire Cloth & Mfg. Co., The
Davison & Co., (Hexham) Ltd.
DENVER EQUIPMENT CO.
Dunham Mfg. & Sales Co., Gordon S.
Fraser & Chalmers Eng. Work
HACK ENG. CO.
Hendrick, Mfg. Co.
Humboldt, Klockner-Humboldt-Deuts AG
Iowa Mfg. Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deuts. A. G.
Krupp, Fried. Maschinen und Stahlbau Rheinhausen
LINK-BELT CO.
Lippmann Engineering Wks., Inc.
MCLANAHAN & STONE CORP.
NORDBERG MFG. CO.
Pegson Ltd.
Pioneer Eng. Div., Poor & Co., Inc.
Rogers Iron Work Co.
Smith Engineering Works
STEARNS-ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
SYMONS—SEE NORDBERG MFG. CO.
TELLURIDE IRON WORKS CO.
TYLER CO., W. S., THE
Universal Dredge Mfg. Co.
Washington Iron Works
Washington Machinery Co.
Wedge Wire Corp.
Yuba Consolidated Industries, Inc.

SHAKING AND VIBRATING**SCREENS**

AERO-VIBE—SEE ALLIS-CHALMERS MFG. CO.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
American Brake Shoe Co., American Manganese Steel Div.
Aveling-Barford, Ltd.
BALDWIN-LIMA-HAMILTON CORP.
BARBER-GREENE CO.
Bonded Scale & Machine Co.
Braun-Knecht-Heimann Co.
CAL-WIC—SEE COLORADO FUEL & IRON CORP., THE
Carpco Mfg. Inc.
Carrier Conveyor Corp.
Cleveland Wire Cloth & Mfg. Co., Inc., The
COLORADO FUEL & IRON CORP., THE
Davison & Co., (Hexham) Ltd.

DEISTER CONCENTRATOR CO.
Deister Machine Co.
DENVER EQUIP. CO.
DRAYO CORP.
Exolon Co., The
Fraser & Chalmers, Eng. Wks.
General Electric Co. Ltd., The
Gründler Crusher & Pulveriser Co.
Gyroset—see Productive Equipment Corp.
HACK ENG. CO.
Hendrick Mfg. Co.
HEWITT-ROBINS, INC.
Humboldt, Klockner - Humboldt-Deuts. A. G.
HUMMER—SEE TYLER CO., THE W. S.
International Combustion Ltd.
Iowa Mfg. Co.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Korb Pettit-Wire Fabrics & Iron Wks., Inc.
Krupp, Fried. Maschinen und Stahlbau Rheinhausen
LEAHY—SEE DEISTER CONCENTRATOR CO.
LINK-BELT CO.
Lippmann Engineering Works
LOW-HEAD—SEE ALLIS-CHALMERS MFG. CO.
Madsen, see Baldwin-Lima-Hamilton Corp.
MCLANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.
THE MARCY MILL DIV.
MINERS FOUNDRY & MFG. CO.
Morgendhamm Mek. Verkskade A.B.
Morse Bros. Machinery Co.
NORDBERG MFG. CO.
Overstrom & Sons
Pegson Ltd.
Permail, Inc.
Pioneer Engineering Div., Poor & Co., Inc.
Productive Equipment Corp.
RIPL FLO—SEE ALLIS-CHALMERS MFG. CO.
Ross Screen & Feeder Co.
Screen Equipment Co., Inc.
Seco—see Screen Equipment Co., Inc.
Selectro—see Productive Equipment Corp.
Slechtechnik G.m.b.H.
Simplicity Engineering Co.
Smith Engineering Works
SOUTHWESTERN ENGR. CO.
STA KLEEN—SEE ALLIS-CHALMERS MFG. CO.
Star Wire Screen & Iron Works, Inc.
STEARNS-ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
SYMONS—SEE NORDBERG MFG. CO.
Symons Bros. Co.
Syntron Co.
Taylor-Wharton Iron & Steel Co.
THERMO-DECK—SEE ALLIS-CHALMERS MFG. CO.
TY-ROCK—SEE TYLER CO., THE W. S.
TY-ROCKET—SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
TYLER-NIAGARA—SEE TYLER CO., THE W. S.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Universal Vibrating Screen Co.
Wedge Wire Corp.
Williams Crusher & Pulveriser Co.
Willmot Engineering Co.
Wolf, Buckau R. (Maschinenfabrik) A. G.
Yuba Consolidated Indus. Mining Div.

STATIONARY SCREENS AND GRIZZLIES

ALLISON STEEL MFG. CO.
American Brake Shoe Co., American Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bixby-Zimmer Engineering Co.
Bonded Scale & Machine Co.
CAL-WIC—SEE COLORADO FUEL & IRON CORP., THE
CARD IRON WKS., CO.
Cleveland Wire Cloth & Mfg. Co.
COLORADO FUEL & IRON CORP., THE
COLUMBIA STEEL CASTING CO., INC.
Davison & Co., (Hexham) Ltd.
DORR-OLIVER, INC.
Fraser & Chalmers Eng. Wks.
Gründler Crusher & Pulveriser Co.
HACK ENG. CO.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Scrubbers

HADFIELD LTD.
Hendrick Mfg. Co.
HEWITT-ROBINS, INC.
Humboldt, Klockner - Humboldt-Deuts AG
Iowa Mfg. Co.
Jeffrey Mfg. Co., The
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deuts, A. G.
Krupp, Fried. Maschinen und Stahlbau Rheinhausen
LINK-BELT CO.
Lippmann Engineering Works
MALLIX-SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.
McLANAHAN & STONE CORP.
NATIONAL IRON CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Nolan Co., The
Os-A-Veyer-see Simplicity Eng. Co.
Pioneer Eng. Div., Poor & Co., Inc.
Ross Screen & Feeder Co.
Simplicity Eng. Co.
Smith Engineering Works
Star Wire Screen & Iron Works, Inc.
STEARNS-ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
Star Wire Screen & Iron Works, Inc.
Syntro Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
TRAYLOR ENGINEERING & MFG. CO.
TYLER CO., THE W. S.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
Wedge Wire Corp.
Yuba Consolidated Indus. Mining Co.

TRAMMELS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
American Brake Shoe Co., Amer. Manganese Steel Div.
AMSCO-SEE AMERICAN BRAKE SHOE CO.
CAL-WIC-SEE COLORADO FUEL & IRON CORP., THE
CARD IRON WKS. CO.
Cleveland Wire Cloth & Mfg. Co.
COLORADO FUEL & IRON CORP., THE
COLUMBIA STEEL CASTING CO. INC.
Crumpler Crusher & Pulverizer Co.
Gundlach Machine Co., T. J.
Hendrick Mfg. Co.
Iowa Mfg. Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
LINK-BELT CO.
Lippmann Engineering Works
Macklin Equip. Co.
McLANAHAN & STONE CORP.
MINERS FOUNDRY & MFG. CO.
NORDBERG MFG. CO.
Pioneer Engineering Div., Poor & Co., Inc.
Rogers Iron Works Co.
Smith Engineering Works
STEARNS-ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
SYMONS-SEE NORDBERG MFG. CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
TRAYLOR ENGR. & MFG. CO.
Universal Engineering Corp.
Washington Iron Wks.
Wedge Wire Corp.
Yuba Manufacturing Co.

VERTICAL SCREENS

LINK-BELT CO.
NORDBERG MFG. CO.
SYMONS-SEE NORDBERG MFG. CO.

VIBRATING GRIZZLIES

LINK-BELT CO.
NORDBERG MFG. CO.
SYMONS-SEE NORDBERG MFG. CO.

WIRE AND BAR SCREENS

American Brake Shoe Co., Amer. Manganese Steel Div.
AMSCO-SEE AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
Bixby-Zimmer Engineering Co.
Bonded Scale & Machine Co.
CAL-WIC-SEE COLORADO FUEL & IRON CORP., THE
Chain Belt Co.
Cleveland Wire Cloth & Mfg. Co.

COLORADO FUEL & IRON CORP., THE

Fraser & Chalmers Eng. Wks.
Gyratoy-see Korb Pettit Wire Fabrics
HACK ENGINEERING CO.
Haver & Boecker
Hein Lehmann & Co.
Hendrick Mfg. Co.
HEWITT-ROBINS, INC. KORB-PETTIT WIRE FABRICS & IRON WORKS, INC., A SUBSID.
Humboldt, Klockner - Humboldt-Deuts AG
International Combustion Products Ltd.
Iowa Mfg. Co.
Klockner-Humboldt-Deuts, A. G.
Korb Pettit Wire Fabrics & Iron Wks., Inc.
LINK-BELT CO.
Lippmann Engineering Works
Ludlow-Saylor Wire Cloth Co.
MALLIX-SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
NORDBERG MFG. CO.
Overstrom & Sons
Pioneer Eng. Div., Poor & Co., Inc.
Productive Equip. Corp.
Ross Screen & Feeder Co.
Simplicity Engineering Co.
Smith Engineering Works
STARSTEEL-see Star Wire Screen & Iron Works, Inc.
Star Wire Screen & Iron Works, Inc.
Sta-Clear-see Ludlow-Saylor Wire Cloth Co.
Sta-Smooth-see Ludlow-Saylor Wire Cloth Co.
Sta-Tru-see Ludlow-Saylor Wire Cloth Co.
Star Wire Screen & Iron Works, Inc.
STEARNS-ROGER MFG. CO.
Super Gyratoy-Korb Pettit Wire Fabrics & Iron Works, Inc.
Super-LOY-see Ludlow-Saylor Wire Cloth Co.
SYMONS-SEE NORDBERG MFG. CO.
Taylor-Wharton Iron & Steel Co.
TY-LOC-SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Wedge Slot-see Hendrick Mfg. Co.
Wedge Wire Corp.
Westfälische Maschinenbau G.m.b.H.
Yuba Consolidated Indus. Mining Div.

SPRAY NOZZLES

Booth Co., Inc., The
Carbofrax-see Carborundum Co., The Refractories Div.
Carborundum Co., The Refractories Div.
Carrier Corp.
Chain Belt Co.
CONCENTRATOR-SEE DEISTER CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
Deister Machine Co.
Goodrich Co., The B. F.
Grinnell Co., Inc.
Humboldt, Klockner - Humboldt-Deuts AG
Iowa Mfg. Co.
LINK-BELT CO.
Pioneer Engineering, Div. Poor & Co., Inc.
Refrax-see Carborundum Co., The Refractories Div.
Res-see Chain Belt Co.
Spraying Systems Co.
Yuba Manufacturing Co.

SCRUBBERS

See also Agitators and Conditioners; Engine Exhaust Conditioners

GAS

Black, Sivalis & Bryson, Inc.
Dorr-Oliver G.m.b.H.
EIMCO CORP., THE
Humboldt, Klockner - Humboldt-Deuts AG
Hunslet Engine Co. Ltd., The
INTERNATIONAL HARVESTER CO.
Johnson-March Corp.
Klockner-Humboldt-Deuts, A. G.
NATIONAL TANK & PIPE CO.
OCM Catalytic Exhaust, Oxy Muffler Exhaust, Oxy-cat-see Oxy-Catalyst, Inc.

Ocm Diesel Exhaust-see Oxy-Catalyst, Inc.
Oxy-Catalyst, Inc.
Peterson Filters & Engr. Co.
Ruth Co., The
SANTA FE TANK DIV., FLUOR PRODUCTS CO.
STEARNS-ROGER MFG. CO., THE
TELLURIDE IRON WORKS CO.
WESTERN PRECIPITATION CORP.
Winslow Eng. & Mfg. Co.

MINERALS WASHER

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Booth Co., Inc., The
Graessler Crusher & Pulverizer Co.
HACK ENGINEERING CO.
HARDINGE CO., INC.
Humboldt, Klockner - Humboldt-Deuts AG
Iowa Mfg. Co.
Knapp & Bates Ltd.
LINK-BELT CO.
Lippmann Engineering Works
MARY-SEE MINE & SMELTER SUPPLY CO., THE
McLANAHAN & STONE CO. MINE & SMELTER SUPPLY CO., THE
Pegson Ltd.
Pioneer Engineering, Div. Poor & Co., Inc.
Rogers Iron Works Co.
Smith Engineering Works
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Washington Machinery Co.
WEMCO-SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.

SELF-LOADING

TRANSPORT,

UNDERGROUND

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Eimco Corp., The
Glams-see Sanford-Day Iron Works, Inc.
HEWITT-ROBINS, INC.
Hudson, B. Ltd.
Irwin Foundry & Mine Car Co.
Jeffrey Mfg. Co., The
LINK-BELT CO.
Napco Industries, Inc.
Sanford Day Iron Wks.
Westinghouse Air Brake Co., (Pa.)
Westinghouse Air Brake Co., La Roi Div.

SEPARATORS

See also Magnetic Equipment; Classifiers; Concentrators

AIR
American Air Filter Co., Inc.
CE-RAYMOND-see Combustion Engineering, Inc.
Combustion Engineering, Inc., Raymond Div.
DRI-AIR-see New Jersey Meter Co.
EIMCO CORP., THE
HARDINGE CO., INC.
Humboldt, Klockner - Humboldt-Deuts AG
INGERSOLL-RAND
I-T-E Circuit Breaker Co.
International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deuts, A. G.
Knapp & Bates Ltd.
LOGAN ENGINEERING CO.
New Jersey Meter Co.
Osborne Laboratories, Inc., Raymond G.

Sly, Mfg. Co. W. W. The
STURTEVANT MILL CO.
Universal Road Machinery Co.
Williams Crusher & Pulverizer Co.

ELECTROSTATIC

American Air Filter Co., Inc.
Carpeo Mfg. Inc.
DINGS MAGNETIC SEPARATOR
Fraser & Chalmers Eng. Works
Johnson, Consultant, Herbert H.
Rapid Magnetic Machines, Ltd.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

HIGH TENSION

Carpeo Mfg. Inc.
Dings Magnetic Separator Co.
JOY, MFG. CO.
Johnson, Herbert B.

SETS, STEEL

See Steel

SHAFT COUPLINGS

See Couplings

SHAFT-MOUNTED

DRIVES

See also Drives; Gears; Open Gearing

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Brown Corp. (Sales) Ltd., David Dodge Mfg. Corp.
Falk Corp., The
LINK-BELT CO.
NATIONAL IRON CO.
Ohio Gear Co., The

SHAFT SINKING

CONTRACTORS

BOYLES BROS. DRILLING CO.
Cementation Co. Ltd., The
DRAVO CORP.
LONGYEAR CO., E. J.
McKenzie & Whittle Cont.

EQUIPMENT

Atlas Copco Pacific, Inc.
ATLAS COPCO AG, SWEDEN
Barker, Davis & Co.
Barrett, Haenss & Co.
Cementation Co. Ltd., The
Coeur d'Alene Hardware & Foundry Co.
Consolidated Pneumatic Tool Co., Ltd.
CRYDERMAN-SEE SHAFT & DEVELOPMENT MACH. CO.
Demag Aktiengesellschaft
EIMCO CORP., THE
EISENHUTT PRINZ RUDOLPH, A.G.
John Wood & Sons, Ltd.
JOY MFG. CO.
Kaiser Engineers
Mayo Tunnel & Mines Equip.
MINERS FOUNDRY & MFG. CO.
PINAZZA-SEE VULCAN IRON WKS. (COLO.)
Shaft & Development Mach.
TELLURIDE IRON WORKS CO.
VULCAN IRON WORKS CO.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., La Roi Div.
Wood & Sons Ltd., John

FORMATION CONSOLIDATION

SHAKERS, CAR

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Carquah-see Stephens-Adamson Mfg. Co.
Cleveland Vibrator Co.
Dusterloh, G. Fabrik fur Bergwerksbedarf G.m.b.H.
HEWITT-ROBINS, INC.
LINK-BELT CO.
R & M-see Robbins & Myer, Inc.
Robbins & Myer, Inc.
Simplicity Eng. Co.
STEPHENS-ADAMSON MFG. CO.
Syntro Co.

SHARPENERS, ROCK

BIT AND STEEL

Armour & Co., Coated Abrasives Div., Alliance, Ohio
ATLAS COPCO A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Bohler Bros. & Co., Ltd.
Bohler, Gebr. & Co. A.G.
Climax Rock Drill & Engineering Works, Ltd.
Coeur d'Alene Hardware & Foundry Co.
Dagenaardt-Utsch K.G.
Demag Aktiengesellschaft
DRAVO CORP.
FLÖTTMAN-WERKE G.M.B.H.
GARDNER-DENVER CO.
Grindex-see Uddeholm Co. of America, Inc.
Holman Bros. Ltd.
INGERSOLL-RAND CO.
JOY MFG. CO.
MASSCO-SEE MINE & SMELTER SUPPLY CO.

MINE & SMELTER SUPPLY CO.
Salsgitter Maschinen A. G.
Security Engineering Div. Dresser
Operations, Inc.
STANCO MFG. & SALES, INC.
Thor Power Tool Co.
Uddeholm Co. of America, Inc.

SHEAVES

See Blocks and Sheaves

SHOVELS, POWER

See Excavators

SHUTTLE CARS

W. G. Allen & Sons (Tipton), Ltd.
Distinguishing Engineering Co., Ltd.
GETMAN BROS. MFG. CO.
Jeffrey Mfg. Co., The
JOY MFG. CO.
Washington Iron Works

SINKERS

See Drills, Rocks

SINTERING

MACHINES

See also Pyrometallurgical

Equipment; Dryers and Kilns,
Pelletizers

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP

American Brake Shoe Co., American
Manganese Steel Div.

AMSCO—SEE AMERICAN BRAKE
SHOE CO.

Acro—see Koppers Co., Inc.
DRAVO CORP.

Dwight Lloyd—see McDowell Co.,
Ltd.

ELECTRIC STEEL FOUNDRY CO.
Hevi-Duty Electric Co.

Heyl & Patterson, Inc.
Huntington, Heberlein & Co., Ltd.

Humboldt, Klockner-Humboldt
Deuts AG

KENNEDY-VAN SAUN MFG. &
ENG. CORP.

MACE CO. THE
McDowell Co., Inc., The Dwight
Lloyd Div.

NATIONAL MALLEABLE &
STEEL CASTINGS CO.

Pollock Co., The William B.
SMITH & CO., F. L.
Standard Steel Corp.

Yuba Manufacturing Co.

SKIPS

See Hoisting Equipment

SLACKLINES

See Excavators

SLINGS

See Rope, Wire

SLUSHERS

See Excavators; Hoisting Equip-
ment; Scrapers

SMELTING &

REFINING

EQUIPMENT

See Pyrometallurgical Equipment

SOLVENTS, URANIUM

see Reagents and Chemicals

SPEED CHANGERS, INCREASERS AND/OR REDUCERS

Allis Co., The Louis
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP

Ampl-Speed—see Electric Machy.
Mfg. Co.

BARBER-GREENE CO.
Bonded Scale & Machine Co.

Brown Corp. (Sales) Ltd., David
BROWN INC., DAVID

Carpco Mfg. Inc.
Christian Engineers, J. D.

Cleveland Worm & Gear Co., The
Demag Aktiengesellschaft

Dodge Manufacturing Corp.
Electric Machinery Mfg. Co.

Falk Corp., The
Farrel-Birmingham Co., Inc.

General Dynamic Corp., Electro Dy-
namie Div.

General Electric Co., Apparatus
Sales Div.

General Electric Co., International
HEWITT-ROBINS, INC.

IN-LINE HELICAL—SEE LINK-
BELT CO.

Int'l General Electric Co.
Lima Electric Motor Co.

LINK-BELT CO.
Master Electric Co., The

Metron Instrument Co.
Morse Chain Co.

Multi-Mounts—see Sterling Elec.
Motors, Inc.

NATIONAL IRON CO.
National Supply Co., (Pa.)

Ohio Gear Co., The
PARALLEL SHAFT GEAR—SEE

LINK-BELT CO.
Philadelphia Gear Works, Inc.

P.I.V.—see LINK-BELT CO.
RADICON—SEE BROWN INC.,

DAVID
Reeves—see Reliance Electric &

Engr. Co.
Reliance Electric & Engr. Co.

Rite-Lo-Speed—see Christian En-
gineers, J.D.

SACO—SEE STEPHENS-ADAM-
SON MFG. CO.

Schoonmaker Co. Inc., P. G.
Shepard Niles Crane & Hoist Corp.

STEARNS-ROGER MFG. CO.
Speedaire—see Cleveland Worm &

Gear, The
STEPHENS-ADAMSON MFG. CO.

Sterling Electric Motors, Inc.
Synrogear—see U.S. Electrical Mo-

tors, Inc.
TELLURIDE IRON WORKS

Torque-Arm—see Dodge Mfg. Co.
U.S. Electrical Motors, Inc.

Universal Gear Works, Inc.
Varidrive—see U. S. Electrical

Motors, Inc.
VARI PITCH—SEE ALLIS-CHAL-

MERS MFG. CO.
Western Gear Corp. (Lynwood)

Westinghouse Elec. Corp.
WESTINGHOUSE ELECTRIC IN-

TERNATIONAL CO.
Worthington Corp.

Yuba Mining Co.

SPIRALS

See Concentrators

SPOTTERS, CAR

Advance Car Mover Co., Inc.

Aldon Company, The
Appleton—see Advance Car Mover

Corp.
Badger Line—see Advance Car

Mover Co., Inc.
Brownie—see Sanford Day Iron

Wks.
Christian Engineers, J.D.

Clyde Iron Works, Inc.
Connellsville Mfg. & Mine Supply

Co.
Gregg Co., Ltd.

HEWITT-ROBINS, INC.

Hough Co., The Frank G.
Jeffrey Manufacturing Co., The
JOY MANUFACTURING CO.
LINK-BELT CO.

Nolan Co., The
Nolan Porta-Feeder—see Nolan Co.,

The
Sanford Day Iron Wks.

STEPHENS-ADAMSON MFG. CO.
Superior-Lidgerwood-Mundy Corp.

Richard Sutcliffe, Ltd.
Vulcan Iron Works (Pa.)

STACKERS

ORE or WASTE

ORENSTEIN-KOPPEL UND LU-
BECKER MASCHINENBAU A.G.

STEEL

See also Bits

ALLOY STEEL

American Brake Shoe Co., American
Manganese Steel Div.

AMSCO—SEE AMERICAN BRAKE
SHOE CO.

Armo Drainage & Metal Prods.,
Inc.

ARMCO STEEL CORP.
ATLAS COPCO AB, SWEDEN

Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.

Bethlehem Pacific Coast Steel Corp.
Bethlehem Steel Co.

Bethlehem Steel Export Corp.
Bohler Bros. & Co., Ltd.

Crucible Steel Co. of America
ELECTRIC STEEL FOUNDRY CO.

English Steel Corp.
Firth Sterling, Inc.

GARDNER-DENVER CO.
HADFIELDS LTD.

Jones & Laughlin Steel Corp.
Junction Bit & Tool Co.

Kaiser Steel Corp.
Mangal—see Stuls-Sickles Co.

Republe Steel Corp.
Ryerson & Son, Inc., Joseph T.

SANDVIK COROMAT—SEE AT-
LAS COPCO, A.B. SWEDEN

SHEFFIELD DIV., ARMCO STEEL
CORP.

SHEFFIELD STEEL CORP.
Sterling—see Firth Sterling, Inc.

Stuls-Sickles Co.
Taylor-Wharton Iron & Steel Co.

TIMKEN ROLLER BEARING CO.,
THE

Uddeholm Co. of America
UNITED STATES STEEL EXPORT

CO.
USS—SEE U.S. STEEL CORP.

U.S. STEEL CORP.
COLUMBIA-GENEVA DIV.

Youngstown Sheet & Tube Co., The

SHEFFIELD DIV., ARMCO STEEL
CORP.
Stahlwerke Sudwestfalen A.G.
Thor Powder Tool Co.
Uddeholms Aktiebolag
Uddeholm Co. of America
VAREL MFG. CO.
Westinghouse Air Brake Co., Le
Roi Div.

SETS—STEEL

ALLISON STEEL MFG. CO.
August Thyssen-Hütte A.G.

Bethlehem Pacific Coast Steel Corp.
Bethlehem Steel Co.

Bochumer Eisenhütte Heintzmann
& Co.

Chapman-Dyer Steel Co.
COLORADO FUEL & IRON

CORP. THE
Commercial Shearing & Stamping

Co.
Guest Keen Iron & Steel Co., Ltd.

Roth Erde Eisenwerk G.m.b.H.

**Manufacturer's Complete Names and Ad-
dresses are listed in Section II, last pages
of this yellow section. Firms appearing in
boldface caps carry advertisements in
this issue.**

Switches, Rail

Universal Atomics
White Instrument Co., David
WILD HEERBRUGG INSTRU-
MENTS, INC.

SWITCHES, RAIL

See Track and Accessories

TABLES

See Concentrators

TANKS

See Thickeners and Tanks;
Agitators and Conditioners

TELEPHONES

See Communications

TELEVISION,

INDUSTRIAL

ACEC
Du Mont Laboratories, Inc., Allen
B.
INTERNATIONAL GENERAL
ELECTRIC CO.
International Geophysics, Inc.
Mine Safety Appliances Co.
Nucleonic Corp. of America
Phillips Electronics, Inc., Instru-
ments Div.

TESTING

See Laboratories

THICKENERS AND

TANKS

See also Cyclones

STEEL TANKS

ALLISON STEEL MFG. CO.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
Bird Machine Co.
Black, Sivalis & Bryson, Inc.
Butler Mfg. Co.
Columbian Steel Tank Co.
Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Dorr-Oliver G.M.B.H.
FEDERAL PIPE & TANK COM-
PANY
Gregg Co., Ltd., The
HACK ENG. CO.
HEAD WRIGHTSON, STOCKTON
FORGE, LTD.
Hirsch Bros. Machinery Co.
Humboldt, Klockner - Humboldt-
Deuts AG
Hydraulic Supply Mfg. Co.
INFILCO, INC.
INTERNATIONAL B. F. GOOD-
RICH CORP.
Kaiser Steel Corp.
Klockner-Humboldt-Deuts, A. G.
Michigan Pipe Co.
MINERS FOUNDRY & MFG. CO.
Morse Bros. Machinery Co.
Pollock Co., The Wm. B.
Sanford-Day Iron Works Inc.
STEARNS-ROGER MFG. CO.
Washington Iron Works
Washington Mach. Co.
Wilmot Engineering Co.
Yuba Consolidated Indus. Mining
Div.

THICKENERS

ALLISON STEEL MFG. CO.
Butler Mfg. Co.
Chain Belt Co.
Columbian Steel Tank Co.
Davison & Co. (Hexham) Ltd.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Dorr-Oliver G.M.B.H.
Eagle Iron Works
EMCO CORP., THE
Float-Treat-Sea Chain Belt Co.
HARDINGE CO., INC.
Hirsch Bros. Machy. Co.
Humboldt, Klockner - Humboldt-
Deuts AG
INFILCO, INC.
International Combustion Ltd.
Klockner-Humboldt-Deuts, A. G.
LINK-BELT CO.
MINERS FOUNDRY & MFG. CO.
Morse Bros. Machinery Co.

NATIONAL TANK & PIPE CO.
SANTA FE TANK DIV., FLUOR
PRODS. CO.
STEARNS-ROGER MFG. CO.
WEMCO—SEE WESTERN MA-
CHINERY CO.
WESTERN MACHINERY CO.
Westfälische Maschinenbau
G.M.B.H.

WOOD TANKS

BAGAC—SEE MAHOGANY IM-
PORTING CO.
Black, Sivalis & Bryson, Inc.
DENVER EQUIP. CO.
Dorr-Oliver G.M.B.H.
FEDERAL PIPE & TANK CO.
Mahogany Importing Co.
Michigan Pipe Co.
MORSE BROS. MACHINE CO.
NATIONAL TANK & PIPE CO.
SANTA FE TANK DIV., FLUOR
CORP.
WINDELER CO., LTD., GEORGE

TIES, TRACK

See Track and Accessories

TIMBER

CONNECTORS & TOOLS

Timber Engineering Co.

MINE

Koppers Co., Inc.
Osmose Wood Preserving Co. of
America, Inc.

SHAFT GUIDES

BAGAC—SEE MAHOGANY IM-
PORTING CO.
GENERAL HARDWOOD CO.
Stanton & Sons, Inc., E. J.

TIMBER FRAMING MACHINES
STEARNS-ROGER MFG. CO.

TIRES AND TUBES,

OFF-HIGHWAY

Dunlop Rubber Co., Ltd.
Firestone Tire & Rubber Co., The
Gates Rubber Co.
The General Tire & Rubber Co.
Goodrich Co., The B. F.
Goodyear Tire & Rubber Co.
INTERNATIONAL B. F. GOOD-
RICH
U. S. Royal—see U. S. Rubber
United States Rubber Intl.

TOOLS, AIR-DRIVEN

PORTABLE

See also Drills, Rock

ATLAS COPCO, AB SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Band-It Co.
Bohler Bros. & Co., Ltd.
Bohler, Gebr. & Co. AG.
CHICAGO PNEUMATIC TOOL
CO.
Consolidated Pneumatic Tool Co.,
Ltd.
Dagobard-Utch KG.
PLOTTMAN-WERKE, G.M.B.H.
GARDNER-DENVER CO.
Haubinc, Maschinenfabrik
Hauhserr, Rudolf & Son G.M.B.H.
Holman Bros. (Canada) Ltd.
Holman Bros. (England) Ltd.
INGERSOLL RAND CO.
JOY MFG. CO.
Le Roi Div. Westinghouse Air
Brake Co.
Loranco—see Newage Intl., Inc.
National Supply Co., (Pa.)
Schramm, Inc.
The Power Tool Co.
VULCAN IRON WORKS CO.
Westinghouse Air Brake Co., Le
Roi Div.
Worthington Corp.
Wright Power Saw & Tool Corp.

TOOLS, INDUSTRIAL

GUN

Mine Safety Appliance Co.
Remington Arms Co., Inc.
Remington Industrial Gun—see
Remington Arms Co.

TORQUE CONVERTERS

SEE TRANSMISSIONS

TRACK & ACCESSORIES

RAIL AND TIES, STEEL

Aldon Co., The
ALLISON STEEL MFG. CO.
Bethlehem Pacific Coast Steel Corp.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
Brown Boverie & Cie A.G.
C F & I—SEE COLORADO FUEL
& IRON CORP., THE
Central Frog & Switch Co., The
Coeur d'Alene Hardware & Foundry
Co.
COLORADO FUEL & IRON
CORP.,
Gregg Co., Ltd., The
GUEST KEEN IRON & STEEL
CO., LTD.
Hadfields Ltd.
Koppers Co., Inc.
Rellly Tar & Chem. Co.
Ryerson & Son, Inc., Joseph T.
U.S. Industries, Inc.
UNITED STATES STEEL CORP.
COLUMBIA-GENEVA DIV.
U. S. Steel Corp., Tennessee Coal &
Iron Div.
UNITED STATES STEEL EXPORT
CO.
USS—SEE U. S. STEEL CORP.

SWITCHES, FROGS, CROSSINGS,

ETC.

Aldon Company, The
AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.
AMERICAN MINE DOOR CO.
AMSCO—SEE AMERICAN BRAKE
CO.
ATLAS CAR & MFG. CO., THE
Bethlehem Pacific Coast Steel Corp.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
British Insulated Callender's Ltd.
CARD IRON WORKS CO., THE,
C. S.
Central Frog & Switch Co., The
EIMCO CORP., THE
ELECTRI-THROW—SEE AMERI-
CAN MINE DOOR CO.
Gregg Co., Ltd., The
HADFIELDS LTD.
Hockensmith Corp., The
Jin Crow—see the Aldon Company
Nolan Co., The
Pettibone-Mulliken Corp.
Salzgitter Maschinen Aktiengesell-
schaft
Samson—see the Aldon Co.
Taylor-Wharton Iron & Steel Co.
USS—SEE U. S. STEEL CORP.
U. S. STEEL CORP. COLUMBIA-
GENEVA DIV.
UNITED STATES STEEL EXPORT
CO.
Weir Kilby Corp.

TRACTORS &

ATTACHMENTS

See Engine Exhaust Condition-
ers, Underground

FORK LIFT TRUCKS

Hyster Co.

TRACTORS

Aggricat—see Jocat Mfg. Co.
Allis-Chalmers Mfg. Co., Buda Div.
Allis-Chalmers Manufacturing Co.,
Construction Machy. Div.
ALLIS-CHALMERS MFG. CO., IN-
DUSTRIES GROUP
American M.A.N. Corp.
American Tractor Equipment Corp.
Autocar—see The White Motor Co.,
Autocar Div.
Brown Corp. (Sales) Ltd., David
Brown Industries, David
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CON-
STRUCTION MACHY. DIV.
CURTISS-WRIGHT CORP., SOUTH
BEND DIV.
DROTT MFG. CORP.
EIMCO CORP., THE
GENERAL MOTORS CORP.,
EUCALID DIV.
GENERAL MOTORS OVERSEAS
OPERATIONS
Hough Co., The Frank G.
Humboldt, Klockner - Humboldt-
Deuts AG

INTERNATIONAL HARVESTER

CO.
International Harvester Export Co.
JOY MFG. CO.
Kaebble, Carl G.M.B.H.
Klockner-Humboldt-Deuts, A. G.—
see Diesel Energy Corp.
LE TOURNEAU WESTINGHOUSE
CO.
MACK TRUCKS, INC.
Mannesmann Export G.M.B.H.
MICHIGAN TURBO-DOZER—SEE
CLARK EQUIPMENT CO.
Minneapolis-Moline Co.
MRS Mfg. Co.
Napco Industries, Inc.
Oliver Corp., The
Pacific Car & Foundry Company
Performer—see Westfall Equipment
Co.
Sheppard Co., R.H.
Southwestern Engineering Co.
TOURNATRATORS—SEE LE-
TOURNEAU-WESTINGHOUSE
CO.
Unimog—see Curtiss-Wright Corp.,
South Bend Div.
Westfall Equipment Co.
VICKERS-ARMSTRONGS (TRAC-
TORS) LTD.
Westfall Equipment Co.
Westinghouse Air Brake Co. (Pa.)
Westinghouse Air Brake Co., Le
Roi Div.
White Motor Co., The, Autocar Div.

ATTACHMENTS

Allis-Chalmers Mfg. Co., Buda Div.
Allis-Chalmers Manufacturing Co.,
Const. Machy. Div.
American Brake Shoe Co., American
Manganese Steel Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
BUCYRUS-ERIE—SEE INTERNA-
TIONAL HARVESTER EX-
PORT CO.
Carco—see Pacific Car & Foundry
Co.
Carroll Tractor Parts—see Craig
Carroll Co.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO.,
CONST. MACHY. DIV.
Craig Carroll Co.
CURTISS-WRIGHT CORP.,
SOUTH BEND DIV.
DROTT MFG. CORP.
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY
CO.
Gar Wood Industries, Inc.
GENERAL MOTORS OVERSEAS
OPERATIONS
Hell Co., The
Hercules Gillion Products, Inc.
Hough—see International Harvester
Export Co.
Hough Co., The Frank G.
Hyster Co.
INTERNATIONAL HARVESTER
CO.
International Harvester Export Co.
JOY MFG. CO.
Kaebble, Carl G.M.B.H.
LE TOURNEAU-WESTINGHOUSE
CO.
Libu Shovel Co., AB.
Minneapolis-Moline Co.
Oliver Corp., The
Pacific Car & Foundry Co.
Pullman—see International Harves-
ter Export Co.
Service Supply Corp.
Skid-Shovel—see Drott Manufactur-
ing Corp.
SKOOKUM CO. INC., THE
SOUTHWESTERN ENGINEERING
CO.
Taylor-Wharton Iron & Steel Co.
TOURNAPULL—SEE LE TOUR-
NEAU-WESTINGHOUSE CO.
Tracto-Rippers—see Tractomotive
Corp.
Tracto-shovel—see Tractomotive
Corp.
Tractomotive Corp.
Unimog—see Curtiss-Wright Corp.,
South Bend Div.
VICKERS-ARMSTRONGS (TRAC-
TORS) LTD.
Westfall Equipment Co.
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roi Div.
Yuba Consolidated Industries, Inc.

TRAILERS

See Trucks and Trailers

TRAIN LOADER SYSTEMS

See also Loaders; Cars
COUPLED CONVEYOR CARS

SLUSHER TRAIN

Cosur d'Alene Hardware & Foundry Co.
JOY MFG. CO.

TRAMMERS

See Locomotives

TRAMWAYS, AERIAL**BUCKETS**

American Brake Shoe Co., American Manganese Steel Div.
British Ropeway Eng. Corp.
Mitchell Ropeways Ltd.
RIBLET TRAMWAY CO.
Sanford-Day Iron Works, Inc.
STEARNS-ROGER MFG. CO.
U. S. Steel Corp., American Steel & Wire Div.
Washington Iron Works

CABLE

Bethlehem Pacific Coast Steel Corp.
British Ropes Ltd.
British Ropeway Engineering Co., Ltd.
Canada Wire & Cable Co., Ltd.
Mitchell Ropeways Ltd.
RIBLET TRAMWAY CO.
ROEBLINGS SONS CORP.
SAUERMAN BROS. INC.
UNITED STATES STEEL CORP., COLUMBIA-GENEVA DIV.
UNITED STATES STEEL EXPORT CO.
Washington Iron Works

TOWERS

ALLISON STEEL MFG. CO.
British Ropeway Eng. Corp.
Gregg Co., Ltd., The
Mitchell Ropeways Ltd.
RIBLET TRAMWAY CO.
SAUERMAN BROS. INC.
STEARNS-ROGER MFG. CO.
TELLURIDE IRON WKS.
Washington Iron Works

TRANSFERS, CAR

AMERICAN MINE DOOR COMPANY
ATLAS CAR & MFG. CO. THE CANTON—SEE AMERICAN MINE DOOR COMPANY
CARD IRON WORKS CO. THE C. S.
FINCO CORP. THE
Greig Co., Ltd. The
Hudson, R., Ltd.
Mayo Tunnel & Mine Equip.
McDowell Co., Inc.
Sanford-Day Iron Works Inc.
TELLURIDE IRON WORKS CO.
UNITED STATES STEEL CORP.
Washington Iron Works
Yuba Consolidated Industries, Inc.

TRANSITS

See Surveying Instruments & Equipment

TRANSMISSIONS**AND TORQUE****CONVERTERS**

ALLISON—SEE GENERAL MOTORS OVERSEAS OPERATIONS
American Blower Div. of American Standard
Barker, Davies & Co.
Berry—see Oliver-Iron & Steel Corp.
Caterpillar Tractor Co.
Cleveland Worm & Gear Co., The
Dodge Mfg. Corp.
Flexidyne—see Dodge Mfg. Corp.
Four Wheel Drive Auto Co., The
General Motors Corp., Allison Div.
GENERAL MOTORS OVERSEAS CORP.
Koppers Co., Fast's Coupling Dept.
Lima Electric Motor Co.
National Supply Co., The

North British Locomotive Co. Ltd.
Oliver Iron & Steel Corp.
Philadelphia Gear Works, Inc.
Renold Chains Ltd.
Reeves—see Reliance Electric & Engineering Co.
Reeves Pulley Co.
Reliance Electric & Engineering Co.
Schneider Mfg. Corp.
Sterling Electric Motors, Inc.
Twin Disc Clutch Co.
U. S. Electrical Motors, Inc.
Varidrive—see U. S. Electrical Motors, Inc.
Western Gear Corp. (Lynwood)

TRIPPERS

See Conveyor Equipment

TROLLEY EQUIPMENT

See also Locomotives
COLORADO FUEL & IRON CORP.
Elreco Corp., The
INTERNATIONAL B. F. GOOD-RICH CORP.
Jeffrey Mfg. Co.
LINK-BELT CO.
Ohio Brass Co.
Ohio Hoist & Mfg. Co.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

TROMMELS

See Screens, Grizzlies, and Accessories

TRUCKS

See Cars, Mine

TRUCK AND TRAILERS

See also Haulage Units

ON-HIGHWAY

A. E. C. Limited
ALLISON STEEL MFG. CO.
American M.A.N. Corp.
Autocar—see White Motor Co., The.
Autocar Trucks Div.
Butler Mfg. Co.
CW—SEE CURTISS-WRIGHT CORP., SOUTH BEND DIV.
CHRYSLER CORP., Dodge Div.
CURTISS-WRIGHT CORP., SOUTH BEND DIV.
DART—SEE K-W DART TRUCK CO.
Differential Steel Car Co.
FWD—Four Wheel Drive Auto Co., The
Fruehauf Trailer Co.
Gallon Allsteel Body Co.
General Motors Corp., GMC Truck & Coach Div.
GENERAL MOTORS OVERSEAS OPERATIONS
Hercules Gallon Products, Inc.
Hercules Steel Products
International—see International Harvester Export Co.
INTERNATIONAL HARVESTER CO.
International Harvester Export Co.
Kaelble Carl G.m.b.H.
KENWORTH—SEE K-W DART
Klockner-Humboldt-Deutz, A. G.
Koehring Co.
MACK TRUCKS INC.
Mannesmann Export G.m.b.H.
Moab Drilling Co.
White Motor Co., The, Autocar Trucks Div.
Winter-Weiss Co., The

OFF-HIGHWAY

A. E. C. Limited
Athey Products Corporation
Augsburg-Nurnberg A.G., Maschinenfabrik (M.A.N.)
Autocar—see The White Motor Co., Autocar Trucks Div.

Aveling-Barford, Ltd.
Butler Mfg. Co.
CW—SEE CURTISS-WRIGHT CORP., SOUTH BEND DIV.
CHRYSLER CORP., Dodge Div.
CURTISS-WRIGHT CORP., SOUTH BEND DIV.
DART—SEE K-W DART TRUCK CO.
Differential Steel Car Co.
Easton Car & Construction Co.
EUCALID—SEE GENERAL MOTORS OVERSEAS OPERATIONS
EUCALID DIV., GENERAL MOTORS CORP.
FWD—Four Wheel Drive Auto Co., The
Fodens Ltd.
Four Wheel Drive Auto Co., The
Fruehauf Trailer Co.
Gallon Allsteel Body Co.
GENERAL MOTORS CORP., EUCALID DIVISION
GENERAL MOTORS OVERSEAS OPERATIONS
GETMAN BROS. MFG. DIV. INC.
Gottwald, Leo
Hell Co., The
Hercules Gallon Products, Inc.
Hercules Steel Products Co.
International—see International Harvester Export Co.
INTERNATIONAL HARVESTER CO.
International Harvester Export Co.
Irwin Foundry & Mine Car Co.
Kaelble, Carl G.m.b.H.
KENWORTH MOTOR TRUCK CO.
Koehring Co.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE CO.
MACK TRUCKS INC.
Marmon-Herrington Co., Inc.
Moab Drilling Co.
Napco Industries, Inc.
ORTRUC, INC.
SCOOT-CRETE—SEE GETMAN BROS. MFG. DIV., INC.
TOURNAROPPER—SEE LE TOURNEAU-WESTINGHOUSE CO.
TOURNAROPPER—SEE LE TOURNEAU-WESTINGHOUSE CO.
Westinghouse Air Brake Co. (Pa.)
White Motor Co., The Autocar Trucks Div.

TRUCK OR TRAILER BODIES
ALLISON STEEL MFG. CO.
Differential Steel Car Co.
Easton Car & Construction Co.
Fruehauf Trailer Co.
Gallon Allsteel Body Co.
Gar Wood Industries Inc.
GENERAL MOTORS OVERSEAS OPERATIONS
Gregg Co., Ltd., The
Hell Co., The
Hercules Gallon Products, Inc.
Hercules Steel Products Co.
Hockensmith Corp., The
Kenworth Motor Truck Co.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE CO.
Penn—see Hockensmith Corp.
Schwartz Mfg. Co.
Winter-Weiss Co., The

TRUCK OR TRAILER BODIES

ALLISON STEEL MFG. CO.
Differential Steel Car Co.
Easton Car & Construction Co.
Fruehauf Trailer Co.
Gallon Allsteel Body Co.
Gar Wood Industries Inc.
GENERAL MOTORS OVERSEAS OPERATIONS
Gregg Co., Ltd., The
Hell Co., The
Hercules Gallon Products, Inc.
Hercules Steel Products Co.
Hockensmith Corp., The
Kenworth Motor Truck Co.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE CO.
Penn—see Hockensmith Corp.
Schwartz Mfg. Co.
Winter-Weiss Co., The

TUNGSTEN CARBIDE**PRODUCTS**

Adamas Carbide Corp.
American Brake Shoe Co., American Manganese Steel Div.
American Coldset Corp.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ATLAS COPCO, AB SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Bohler Bros. & Co., Ltd.
BRUNNER & LAY, INC.
Carboloy—see General Electric Co.
The Cementation Corp.

Craellus Company, Ltd.
Eutectic Welding Alloys Corp.
Firth Sterling Inc.
Firth Sterling—see Firth Sterling Inc.
General Electric Company—Metalurgical Products Dept.
General Electric Co., Metallurgical Products Dept.
Harmet—see American Coldset Corp.
Haynes Stellite Co.
Haytellite—see Haynes Stellite Co.
Holman Bros. Ltd.
INTERNATIONAL GENERAL ELECTRIC CO.
Intra-Set—see Brunner & Lay, Inc.
Junction Bit & Tool Co.
Kennametal Inc.
LONGYEAR CO., E. J.
Manchester Bit Corp.
McCaughey Industrial Corp.
Metal Carbide Corp.
National Carbon Co.
National Carbide Co.
ROK-BITS—SEE BRUNNER & LAY, INC.
STOODY CO.
Svenska Motorborr AG
Uddeholm Co. of America
Uddeholms Aktiebolag
VAREL MANUFACTURING CO.
Vascoloy-Ramet Corp.
WESTERN ROCK BIT MFG. CO.

VACUUM FILTERS

See Filters

VACUUM PUMPS

See Pumps

VALVES

ALLEN-SHERMAN-HOFF PUMP CO. THE
ACF Industries, Inc., American Car & Foundry Div.
American Brake Shoe Co., American Manganese Steel Div.
American Chain & Cable Co., Inc., R P & C Valve Div.
American Locomotive Co.
Ampeco Metal, Inc.
Barrett, Haentjens & Co.
Birkett, Billings & Newton, Ltd.
Black, Sivalls & Bryson, Inc.
Bridgeport Brass Co.
Bristol Co., The
Chase Brass & Copper Co.
Clarkson Co., The
Cosur d'Alene Hardware & Foundry Co.
Commercial Shearing & Stamping Co.
Crane Co.
Duriron Co., Inc., The
ELECTRIC STEEL FOUNDRY CO.
Farris Engineering Corp.
Farval Corp., The
Flex—see Farris Flexible Valve Corp.
FLEX-CHECK—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
Flexible Valve Corp.
General-American Valve Co.
Goodrich Co., B. F.
Grinnell Co., Inc.
Grinnell-Saunders—see Grinnell Co., Inc.
Hasseltin—see Barrett, Haentjens & Co.
INFILCO, INC.
INTERNATIONAL B. F. GOOD-RICH
Krebs—see Equipment Engineers, Inc.
Lead Lined Iron Pipe Co.
Leden Mfg. Co.
Mag-Pneu-Power Trap—see Hanks Corp.
MASSCO GRIGSBY—SEE MINE & SMELTER SUPPLY CO., THE
McDowell Co., Inc.
McNally Pittsburg Co.
MINE & SMELTER SUPPLY CO.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Ohio Brass Co.
PACIFIC PIPE CO.
Philadelphia Gear Wks., Inc.
Rockwell Mfg. Co.
R-PAC Valve Div., American Chain & Cable Co., Inc.
Super-Seal Flex—see Farris Flexible Valve Corp.
United States Rubber Co.
Vietaulic Co. of America
Walworth Co.
Warren, Morrison Ltd.
Watts Regulator Co.
WESTERN PRECIPITATION CORP.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Xanthates

Westinghouse Air Brake Co.
Cleveland Rock Drill Div.
Westinghouse Air Brake Co.
Industrial Products Div.

VENTILATION EQUIPMENT AND BLOWERS

BRATTICE CLOTH AND TUBING
ABC—SEE AMERICAN BRATTICE
CLOTH CORP.
AMERICAN BRATTICE CLOTH
CORP.
Bemis Bro. Bag Co.
George Moss Fly. Ltd.
Hanover Industries, Inc.
Humboldt, Klockner-Humboldt-Deuts
AG
INTERNATIONAL B. F. GOOD-
RICH CORP.
KOROSEAL—SEE INTERNA-
TIONAL B. F. GOODRICH
Rubber Improvement Ltd.

MINE FANS AND BLOWERS
Aerodyne—see Jeffrey Mfg. Co. The
American Air Filter Co., Inc.
American Blower Div. of American
Standard
AXIVANE—SEE JOY MFG. CO.
Brown—see Sanford-Day Iron
Wks.
Carrier Corp.
Cleveland Worm & Gear Co. The
Coppus Engineering Corp.
Demag A.G.
Fraser & Chalmers Eng. Works
George Moss Pty. Ltd.
GRAYBAR ELECTRIC CO., INC.
Holman Bros. Ltd.
Homelite Corp.
INGERSOLL-RAND CO.
International Engr., Inc.
Jeffrey Mfg. Co.
John Wood & Sons, Ltd.
JOY MFG. CO.
Koppers Co., Inc.
Mannesmann Export G.m.b.H.
Mine Safety Appliance Co.
NORTHERN BLOWER CO.
Propellair—see Robbins & Myers,
Inc.
Robbins & Myers, Inc.
Rubber Improvement Ltd.
Sanford-Day Iron Wks.
Standard Elec. Mfg. Co., Inc.
Sutobelt Corp.
Techn. Ind. en Handelsonderneming
Torit Manufacturing Co.
Turbo-Maschinen A.G.
U. S. Hoffman Machinery Corp.
Vano—see Coppus Eng. Co.
Ventair—see Coppus Eng. Co.
WEDAG (Westfalia Dinnendahl
Groppe AG)
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.
Westinghouse Electric Corp., Sturte-
vant Div.

VENTILATION PIPE AND TUBING
ABC—SEE AMERICAN BRATTICE
CLOTH CORP.
Amazair—see Cementation Co., Ltd.
The
AMERICAN BRATTICE CLOTH
CORP.
Armco Drainage & Metal Products,
Inc.
Ayrtube—see Flexible Tubing Corp.
Bemis Bro. Bag Co.
Carrier Corp.
Cementation Co. Ltd., The
Coeur d'Alene Hardware & Foundry
Co.
Colonial Plastics Mfg. Co., The
DeLaval Steam Turbine Co.
Druso-vent—see Drullard Co.,
Howard
Du Pont De Nemours & Co., Inc.,
Fabrica Div.
Fagertun Fabrikker A/S
FLEXIBLE DUCTING
Flexible Tubing Corp.
Goodrich Co., The B. F.
Hanover Industries, Inc.
INTERNATIONAL B. F. GOOD-
RICH
John-Manville Sales Corp.
MINE VENT—SEE AMERICAN
BRATTICE CLOTH CORP.
NAYLOR PIPE CO.
NEOLON—SEE AMERICAN
BRATTICE CLOTH CORP.
Rubber Improvement Ltd.
Spiratube—see Flexible Tubing
Corp.
TELLURIDE IRON WKS.
Torit Manufacturing Co.
Transite—see John-Manville

Van-Cor—see Colonial Plastics Mfg.
Mfg. Co., The
Venture—see Du Pont de Nemours
& Co., Inc., Fabrics Div.

VIBRATORS

See Bins, Chutes and Accessories

WASHERS LOG

**ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP**
Barkers—see Washington Iron
Works
Davison & Co., (Hexham) Ltd.
Eagle Iron Works
Fraser & Chalmers Eng. Works
Humboldt, Klockner-Humboldt-
Deuts, A. G.
Iowa Mfg. Co.
Klockner-Humboldt-Deuts, A. G.
Knapp & Bates Ltd.
LAKE SHORE INC.
LINK-BELT CO.
Lippmann Engineering Works
McLANAHAN & STONE CO.
McNally Pittsburgh Co.
Pioneer Engineering Div., Peer &
Co., Inc.
Scott's Concentrators
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Universal Engr. Corp.
Washington Iron Works
Washington Machinery Co.
Yuba Mining Co.

WELDING

EQUIPMENT, SUPPLIES AND SERVICES

EQUIPMENT

ACEC
Abrasa-weld—see Lincoln Electric
Co.
Alreco—see Air Reduction Sales Co.
Air Reduction Sales Co.
American Brake Shoe Co., American
Manganese Steel Div.
American Chain & Cable Co., Inc.,
Page Steel & Wire Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Auto Arc-Weld Mfg. Co.
Borrmann-Brenner-Berlin
Caterpillar Tractor Co.
Circle-Cutter—see Ideas, Inc.
Deloro Stellite Ltd.
Fleetweld—see Lincoln Electric Co.
Gar Wood Industries, Inc.
General Electric Co., Apparatus
Sales Div.
HARNISCHFEGGER CORP.
Hobart Bros. Co.
Ideal arc—see Lincoln Electric Co.
Industrial Air Products Co.
International General Electric Co.
Jetweld—see Lincoln Electric Co.
Kenco
Lincoln Electric Co.
Linde Air Prod. Co.
Motor Generator Corp.
Ohio Brass Co.
Oxi-Gasoline Cutting Torch—see
Princeton Gripshot, Inc.
RANKIN MFG. CO.
Shield arc—see Lincoln Electric Co.
TELLURIDE IRON WKS.
Tweco Prod., Inc.
Union Carbide and Carbon Corp.,
Linde Air Products Company
Div.
Wall Colmonoy Corp.
WESTINGHOUSE ELECTRIC
INTERNATIONAL CO.
Wilson-Weld—see Wilson Prod.,
Inc.
Willson Prod., Inc.
Worthington Corp.

HARD FACING

Abrasa-weld—see Lincoln Electric
Co.
Alreco—see Air Reduction Sales Co.
Air Reduction Sales Co.
American Brake Shoe Co., American
Manganese Steel Div.
Ampos Metal, Inc.
AMPCO-Trode—see Ampeco Metal,
Inc.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Auto Arc Weld Mfg. Co., The
Chromo-Loy—see Resisto-Loy Co.
Crucible Steel Co. of America
Deloro Stellite Ltd.

Eutectic Welding Alloys Corp.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus
Sales Div.
HARNISCHFEGGER CORP.
Harcrome—see Haynes Stellite Co.
Haynes Stellite Co.
Haystallite—see Haynes Stellite Co.
Hobart Bros. Co.
Ideal arc—see Lincoln Electric Co.
Industrial Air Products Co.
Isorod—see Resisto-Loy Co.
Jetweld—see Lincoln Electric Co.
Kenco
Kennametal, Inc.
Lincoln Electric Co.
Linde Air Products Co.
Manga-Tone, N-M—see Resisto-Loy
Co.
Manga-Kote—see Resisto-Loy Co.
Motor Generator Corp.
Multimet—see Haynes Stellite Co.
RANITE—SEE RANKIN MFG. CO.
Resisto-Loy Co.
Rezweld—see Crucible Steel Co. of
Amer.
Roll Matrix—see All-State Welding
Alloys Co., Inc.
Sanford-Day Iron Works, Inc.
Seaco—see Stuls-Sickles Co.
Shieldarc—see Lincoln Electric Co.
STOODY CO.
Stuls-Sickles Co.
Taylor-Wharton Iron & Steel Co.
Union Carbide and Carbon Corp.,
Haynes Stellite Co. Div.
Union Carbide and Carbon Corp.,
Linde Air Products Co. Div.
Wall Colmonoy Corp.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.
WELDING RODS
Abrasa-weld—see Lincoln Electric
Co.
Alreco—see Air Reduction Sales Co.
Air Reduction Sales Co.
American Brake Shoe Co., American
Manganese Steel Div.
American Chain & Cable Co., Inc.,
Page Steel & Wire Div.
AMPCO Metal, Inc.
AMPCO-Trode—see AMPCO Metal,
Inc.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Bridgeport Brass Co.
Crucible Steel Co. of America
Deloro Stellite Ltd.
Eutectic Welding Alloys Corp.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus
Sales Div.
HARNISCHFEGGER CORP.
Haynes Stellite Co.
Hastelloy—see Haynes Stellite Co.
Hobart Bros. Co.
Ideal arc—see Lincoln Electric Co.
Industrial Air Products Co.
INTERNATIONAL GENERAL
ELECTRIC CO.
INTERNATIONAL B. F. GOOD-
RICH CORP.
Jetweld—see Lincoln Electric Co.
Kenco
KOROSEAL—SEE INTERNATIONAL
AL B. F. GOODRICH CORP.
Lincoln Electric Co.
Linde Air Prod. Co.
Manganal—see Stuls-Sickles Co.
Motor Generator Corp.
Multimet—see Haynes Stellite Co.
Phos-Trode—see AMPCO Metal,
Inc.
Resisto-Loy Co.
Revere Copper & Brass, Inc.
Resistal Stainless—see Crucible
Steel Co. of Amer.
Shield Arc—see Lincoln Electric Co.
SteelArc—see All-State Welding
Alloys Co., Inc.
STOODY CO.
Stuls-Sickles Co.
Taylor-Wharton Iron & Steel Co.
Two-Lite Aluminum Welding
Cable—see Tweco Products,
Inc.
Tweco Products, Inc.
Union Carbide and Carbon Corp.,
Linde Air Products Co. Div.
UNITED STATES STEEL EXPORT
CO.
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.
GENERAL SUPPLIES
Abrasa-weld—see Lincoln Electric
Co.
Alreco—see Air Reduction Sales Co.
Air Reduction Sales Co.
American Chain & Cable Co., Inc.,
Page Steel & Wire Div.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus
Sales Div.
Hobart Bros. Co.

Ideal Arc—see Lincoln Electric Co.
Industrial Air Products Co.
INTERNATIONAL GENERAL
ELECTRIC CO.
Jetweld—see Lincoln Electric Co.
Kenco
Lincoln Electric Co.
Linde Air Prod. Co.
Mine Safety Appliances Co.
Motor Generator Corp.
Shield Arc—see Lincoln Electric Co.
SIMPLEX WIRE & CABLE CO.
Tweco Products, Inc.
Union Carbide and Carbon Corp.,
Linde Air Products Co. Div.
Westinghouse & Electric Corp.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.

WELDMENTS, STEEL

Falk Corp., The

WINCHES

See also Hoisting Equipment
ELECTRIC

ACEC
Austin Hopkinson & Co. Ltd.
Beaumont—see International Com-
bustion Ltd.
Beebe Bros.
Brown—see Sanford-Day Iron
Wks.
CHICAGO PNEUMATIC TOOL
CO.
Clyde Iron Works, Inc.
Demag Aktiengesellschaft
EISENHUTT PRINZ RUDOLPH,
A.G.
Hasenclever, Maschinenfabrik A.G.
HARNISCHFEGGER CORP.
Holman Bros. Ltd.
INGERSOLL-RAND CO.
International Combustion Ltd.
John Wood & Sons, Ltd.
JOY MFG. CO.
Kema (Kohn-Ehrenfelder Maschin-
enbau-Anstalt)
LAKE SHORE, INC.
Leden Mfg. Co.
LINK-BELT CO.
Lug-All Co., The
John Mills & Co.
Mobile Drilling, Inc.
Ohio Hoist & Mfg. Co.
R & M—see Robbins & Myers, Inc.
Robbins & Myers, Inc.
Round Chain Co.
Sanford-Day Iron Wks., Inc.
SAUERMAN BROS., INC.
Shepard Niles Crane & Hoist Corp.
STEPHENS-ADAMSON MFG. CO.
VULCAN-DENVER—SEE VUL-
CAN IRON WORKS (DEN-
VER)
VULCAN IRON WORKS (DEN-
VER)
Westinghouse Electrical Corp.
Yale and Towne Mfg. Co.
Yuba Consolidated Indus. Mining
Div.

HAND

Beebe Bros.
Channon Corp., J. H.
Christian Engineers, J. D.
Clyde Iron Wks., Inc.
Coeur d'Alene Hardware & Foundry
Co.
Gripshot, Inc.
HARNISCHFEGGER CORP.
Leden Mfg. Co.
LINK-BELT CO.
Lug-All Co.
John Mills & Co.
Ohio Hoist & Mfg. Co.
Pacific Car & Foundry Co.
Princeton Gripshot, Inc.
Roberts & Schaefer Co.
Round Chain Co.
SAUERMAN BROS., INC.
STEPHENS-ADAMSON MFG. CO.
Yale and Towne Mfg. Co.
Yuba Mining Co.

WIRE

See Cable and Conduit

WIRE CLOTH

See Screens, Grizzlies, and
Accessories

WIRE ROPE

See Rope, Wire

XANTHATES

See Reagents and Chemicals

SECTION II

Manufacturers' Index

Advertisers in Boldface

SECTION II contains an alphabetical list of the names and complete addresses of the principal manufacturers of specialized MINE-MILL-SMELTER

equipment. The names of manufacturers who are represented in this issue by catalogs or advertisements are printed in **BOLDFACE** type.

A

A & A Mfg. Co., Inc., 712 So. 12th Street, Milwaukee 4, Wisconsin
 ABC's Scale Division, McDowell Co., Inc., 16360 Waterloo Road, Cleveland 10, Ohio
 The Abem Company, Danderydsgatan 11, Stockholm, Sweden
 Abrams Aerial Survey Corp., 606 East Shiawassee St., Lansing 1, Mich.
 ACEC (Ateliers de Constructions Electriques de Charleroi) Charleroi, Belgium
 A.C.F. Industries, Inc., American Car & Foundry Div., 30 Church St., N.Y. 8, N.Y.
ACKER DRILL CO. INC., P.O. BOX 830, 725 W. LACKAWANA AVE., SCRANTON 10 PA.
 Acme Electric Corp., 2001 Water St., Cuba, N.Y.
 Adamas Carbide Co., 121 Market St., Kenilworth, N.J.
 Advance Car Mover Co., Inc., 112 N. Outagamie St., Appleton, Wis.
 A.E.C. Ltd., Southall, Middlesex, England
 Aero Service Corp., 210 E. Courtland St., Philadelphia 30, Pa.
 African Surveys (Proprietary) Ltd., 44 Negret St., Johannesburg, U. of So. Africa
 Agence Miniere & Maritime S. A., 3 Rue Van Bree, Anvers, Belgium
 Ainsworth Wm., & Sons, Inc., 2151 Lawrence St., Denver 5, Colo.
 Air Placement Equip. Co., 1009-11 W. 24th St., Kansas City 8, Mo.
 Air Reduction Sales Co., 150 East 42nd St., New York 17, N.Y.
 Aldon Company, The, 3333 Ravenswood Ave., Chicago 18, Ill.
 Alimak-Verken A B P.O. Box 954 Stockholm-Hagersten 9, Sweden
 Allen & Garcia Co., 332 S. Michigan Ave., Chicago 4, Ill.
ALLEN-SHERMAN-HOFF PUMP CO. THE, 239 E. LANCASTER AVE., WYNEWOOD, PA.
 W. C. Allen & Sons (Tippon) Ltd., P.O. Box No. 4, Princes End, Tipton, Staffs
 Alley & McClellan (Polmadie) Ltd., Glasgow, S.2, Scotland
 Allied Chemical & Dye Corp., Barrett Div., 40 Rector St., New York 6, N.Y.
 Allied Chemical & Dye Corp., General Chemical Div., 40 Rector St., New York 6, N.Y.
 Allis-Chalmers Mfg. Co., Engine-Material Handling Equip., 1135 S. 70th St., Milwaukee 1, Wis.
ALLIS-CHALMERS MFG. CO. INDUSTRIES GROUP, MILWAUKEE 1, WIS.
 Allis-Chalmers Mfg. Co., Construction Machy. Div., Box 512, Milwaukee 1, Wis.
 Louis Allis Co., The, 427 E. Stewart St., Milwaukee 1, Wis.
ALLISON STEEL MFG. CO., P.O. BOX 6047, PHOENIX, ARIZ.
ALLOY STEEL & METALS CO., 1848 EAST 55TH ST., LOS ANGELES 53, CALIF.
 Alphonse Wire & Cable Co., P.O. Box 709, New Brunswick, N.J.
 Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.
 AB Alvenius Industrier, Kungsgatan 75, Eskilstuna, Sweden
 Amag-Hilpert-Fegnitzhutte A.G., Werke Pegnitz, Nurnberg, Germany
 Amercoat Corp., 4809 Firestone Blvd., Southgate, Calif.
 American Air Filter Co., 215 Central Ave., Louisville 8, Ky.
 American Blower Div. of American Standard, Detroit 32, Mich.
AMERICAN BRAKE SHOE CO., 530 5TH AVE., NEW YORK 36, N.Y.
 American Brake Shoe Co., Ramapo Ajax Div., Export Div., 230 Park Ave., New York 17, N.Y.
 American Brake Shoe Co., American Manganes Steel Div., 380 E. 14th St., Chicago Heights, Ill.
AMERICAN BRATTICE CLOTH CORP., 230 S BUFFALO ST., P.O. BOX 187, WARSAW, IND.
 American Chain & Cable Co., Page Steel & Wire Div., Monaca, Pa.
 American Chain & Cable Co., Helicord Gage Div., Bridgeport 2, Conn.

American Chain & Cable Co., Inc., American Cable Div., York, Pa.
 American Chain & Cable Co., Inc., American Chain Div., Princess & Charles Sts., York, Pa.
 American Chain & Cable Co., Inc., Hazard Wire Rope Div., Wilkes-Barre, Pa.
 American Chain & Cable Co., Inc., R-P & C Valve Div., Reading, Pa.
 American Chain & Cable Co., Inc., Wire Rope Div., 271 S. Pennsylvania Ave., Wilkes-Barre, Pa.
 American Chain & Cable Co., Inc., Wright Hoist Div., York, Pa.
 American Coldast Corp., U.S. Highway 46, Teterboro, N.J.
 American Cyanamid Co., Explosive Dept., 30 Rockefeller Plaza, New York 20, N.Y.
AMERICAN CYANAMID CO., MINERAL DRESSING DEPT., 30 ROCKEFELLER PLAZA, NEW YORK 20, N.Y.
 American Hoist & Derrick Co., 63 So. Robert St., Paul 7, Minn.
 American Hoist & Derrick Co., Crosby-Laughlin Div., P.O. Box 570, Ft. Wayne, Ind.
 American Locomotive Co., 80 Church St., N.Y. 10, N.Y.
 American Machine & Metals, Inc., East Moline, Illinois (Riehle Testing Machines Div.)
 American M.A.N. Corp., 149 Broadway, New York 6, N.Y.
AMERICAN MINE DOOR CO., 2671 DUEBER AVE., S. W. CANTON 6, OHIO
AMERICAN POTASH & CHEMICAL CORP., 3630 W. 6TH ST., LOS ANGELES 54, CALIF.
 American Rubber Mfg. Co., 1145 Park Ave., Oakland, Calif.
AMERICAN SMELTING & REFINING CO., CRANDALL BLDG., SALT LAKE CITY, UTAH
 American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif.
AMERICAN ZINC SALES CO., 1630 PAUL BROWN BLDG., ST. LOUIS, MO.
 Ampco Metal, Inc., 1716 South 38th St., Milwaukee 46, Wis.
ANACONDA WIRE & CABLE CO., 25 BROADWAY, NEW YORK CITY 4, N.Y.
 Analytical Measurements, Inc., 585 Main St., Chatham, N.J.
 Anderson, Boyes & Co. Ltd., Flemington Electrical Works, Motherwell, Scotland
 Andreu Stahl Maschinenfabrik, Wuhlthagen Newstadt/Wurtt, Germany
 Apache Powder Co., Box 518, Benson, Arizona
 Appleton-Atlas Car Mover Corp., 1421-25 S. 2nd St., Milwaukee 4, Wisconsin
 Arizona Bag Co., 1502 So. 33rd Ave., Phoenix, Ariz.
ARIZONA TESTING LABORATORIES, 817 WEST MADISON ST., P.O. BOX 1888, PHOENIX, ARIZ.
 Armeo Drainage & Metal Products, Inc., 703 Curtis St., Middletown, Ohio
ARMCO STEEL CORP., 703 CURTIS ST., MIDDLETOWN, OHIO
 Armour and Company, Coated Abrasives Division, 16123 Armour St. N.E., Alliance, Ohio
 Armour Chemical Division, 1355 West 31st St., Chicago 9, Ill.
 Armstrong-Bray & Co., 5856 Northwest Highway, Chicago 30, Ill.
ASEA ELECTRIC INC., 500 FIFTH AVE., N.Y.C. N.Y.—SEE ASEA
ASEA, VASTERAS, SWEDEN
 Askania-Werke A.G., Berlin-Friedenau, Germany
 Athey Products Corp., 5631 West 65th St., Chicago 38, Ill.
ATLAS CAR & MFG. CO., 1145 IVANHOE RD., CLEVELAND 16, OHIO
ATLAS COPCO EASTERN, INC., 610 INDUSTRIAL AVE., PARAMUS, N.J.
ATLAS COPCO PACIFIC, INC., 930 BRITANT AVE., SAN CARLOS, CALIF.
ATLAS COPCO, A. B. STOCKHOLM 1, SWEDEN
ATLAS POWDER COMPANY, WILMINGTON 39, DELAWARE
 Atomic Engineering Corp., 424 S. 7th St., P.O. Box 1701, Grand Junction, Colo.
 Augsburg-Nurnberg A. G., Maschinenfabrik (M.A.N.)—See American M.A.N. Corp.

August Thysen-Hutte A. G., Franz-Lessestrasse 3, Dulsburg-Hamborn, W. Germany
 Austin Hopkinson & Co., Ltd., Delta Works, Audenshaw, Manchester, England
 Autair, Ltd., 76 Wigmore Street, London W. 1, England
 Auto Arc-Weld Mfg. Co., The, 9615 Meech Ave., Cleveland 5, Ohio
 Autocar Division, White Motor Co., Exton, Pa.
 Aveling-Barford, Ltd., Grantham, Lincolnshire, England

B

B.I.F. Industries, Inc., 345 Harris St., Providence, R.I.
BABCOCK & WILCOX CO., BOILER DIV. THE, 161 EAST 42ND ST., NEW YORK 17, N.Y.
 Badger Fire Extinguisher Co., Chase St., Methuen, Mass.
 Baldwin-Lima-Hamilton Corp., 2332 Philadelphia Nat. Bank Bldg., Philadelphia 7, Pa.
 Baldwin-Lima-Hamilton Corp., Eddystone Div., Philadelphia 42, Pa.
BALDWIN-LIMA-HAMILTON CORP., LIMA-HAMILTON DIV., PHILADELPHIA 42, PA.
 Band It Co., 48th & Dahlia, Denver 16, Colo.
BARBER-GREENE CO., 490 NORTH HIGHLAND AVE., AURORA, ILLINOIS
 Barker, Davies & Co., Old Bank Chambers, Pontypriid, Glam., U.K.
 Barrett, Haentjens & Co., P.O. Box 36, Hasleton, Pa.
 Bath Iron Wks. Corp., Rm. 1758, West Chester, Pa.
 Baukol, Philip J., 2054 University Ave., Berkeley, Calif.
 Bauecl & Lomb Optical Co., 682 St. Paul St., Rochester, New York
 Bavaria Maschinenfabrik, J. Hilber, Industriestrasse/34 Neu-Ulm (Donau) Germany
 Baxter, Ltd., W. H., 71 Gelderd Rd., Leeds 12, Yorkshire, England
 Becker-Frunte, GmbH, Datteln (Westfal) W. Germany
 Beckman Instruments, Inc., Scientific Instruments Div., 2500 Fullerton Road, Fullerton, Calif.
 Bedford & Sons, Ltd., John-Lion Works, Sheffield, Yorks, England
 Beebe Bros., 2724 Sixth Ave., S. Seattle 4, Wash.
 Bell Helicopter Corp., P.O. Box 482 Ft. Worth 1, Texas
 Bellis & Marcom Ltd., Ledam St., Works, Birmingham 16, England
 Bemis Bro. Bag Co., 111 N. 4th St., Box 23, St. Louis 2, Mo.
 Bendisari, F.N., First National Bank, Joplin, Mo.
 Bendix Aviation Corp., Cincinnati Div., 3130 Wasson Rd., Cincinnati 4, Ohio
 Berger & Sons, Inc., C. L., 37 Williams St., Boston 19, Mass.
 Berk & Co., Inc., F. W. 275 Brannan St., San Francisco 7, Calif.
 Bethlehem Pacific Coast Steel Corp., 20th & Illinois Streets, San Francisco, California
 Bethlehem Steel Co., E. 3rd St., Bethlehem, Pa.
 Bethlehem Steel Export Corp., 25 Broadway, N.Y. 4, N.Y.
 Bloco, Inc., 3116 Valhalla Drive, Burbank, Calif.
 Bin-Dicator Co., The, 13946 Kercheval Ave., Detroit 15, Mich.
 Bird Machine Co., South Walpole, Mass.
 Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
 T. W. Birkett, Billington & Newton, Ltd., P.O. Box 201, Hanley, Stoke-on-Trent, Staffs, England
 Bisciolto-Werke KG, vorm. Pfingstmann-Werke, Heilbachstr. 84-86, Recklinghausen-Sud, Germany
 Dixby-Zimmer Engineering Co., 961 Abingdon St., Galesburg, Ill.
BLACK & DEASON, BOX 1888, SALT LAKE CITY 1, UTAH
BLACK'S MINING EQUIPMENT, LTD., 167 MASON'S HILL, BROMLEY, KENT, ENGLAND
 Black, Sivalis & Bryson, Inc., 7500 E. 12th St., Kansas City 26, Mo.

Blackhawk Mfg. Co., Milwaukee 46, Wis.
 Bladon-Dunham Ltd., Framwellgate Works,
 Durham City, County Durham, Ireland
 Blaw-Knox Co., Blaw-Knox Div., Farmers
 Bank Bldg., Pittsburgh, Pa.
 Boshamer Eisenhutte Heintemann & Co.,
 Bochum, Germany
 Bohler Bros. & Co. Ltd., Elisabethstrasse 14,
 Vienna 1, Austria
 Bohler, Gebr. & Co., AG, Hansa-Allee 321,
 Dusseldorf-Oberkassel, Germany
 Bohler Bros. & Co. Ltd., Steel Works
 Bonded Seals & Machine Co., 2173 So. 3rd St.,
 Columbus, Ohio
 Bookline, Incorporated, 3736 South 3100 East
 St., Salt Lake City 9, Utah
 Booth Co., Inc., The, 333 W. 14th St., Salt
 Lake City 4, Utah
 Borg-Warner Ind.—see Morse Chain Co.,
 N.Y.
 Bornmann-Brenner-Berlin, Blucherstrasse 23,
 Berlin S.W. 61, Germany
 Borsig, AG, Berliner Str. 19-37, Berlin-Tegel
 (Westsektor), Germany
 Boston Woven Hose & Rubber Co., P.O. Box
 1071, Boston 3, Mass.
 E. Boydell & Co., Ltd., Elsinore Road, Old
 Trafford, Manchester, England
 BOYLES DRUGS, DRILLING CO., 1321 S.
 MAIN ST., SALT LAKE CITY, UTAH
 Boyles Bros. Drilling Co. Ltd., 1275-91 Parker
 St., Vancouver 6, B.C., Canada
 Braun & Co., C. F., Brauns International Corp.,
 1090 Fremont Avenue, Alhambra, Calif.
 Braum Chemical Co., 1943 So. Bonnie Beach
 Place, Los Angeles 64, Calif.
 Braun Corp., 2360 E. 19th St., Los Angeles
 21, Calif.
 Braun-Knecht-Helmer Co., 1409 16th St., San
 Francisco 19, Calif.
 Bridgeport Brass Co., 30 Grand St., Bridge-
 port, Conn.
 Briggs & Stratton Corp., 2711 North Thir-
 teenth St., Milwaukee 1, Wis.
 F. J. Brindle & Sons (Sheffield) Ltd., River
 Lane, Sheffield 1, England
 Bristol Co., The, P.O. Box 1790 MW Water-
 bury 20, Conn.
 British Insulated Callender's Cables, Ltd., 21
 Bloomsbury St., London W.C. 1
 British Jeffrey-Mamond Ltd., Stennard Works,
 Wakefield, Yorks, England
 British Ropes Ltd., Doncaster, Yorkshire, Eng-
 land
 British Ropes Ltd., Export Sales Div., 52 High
 Holborn, London, England
 British Ropeway Engineering Co., Ltd., Plan-
 tation House, Mincing Lane, London E.C.3,
 England
 Broadbent & Son, Ltd., Robert, Phoenix Iron
 works, Stalybridge, England
 Broderick & Bascom Rope Co., 4208 Union
 Blvd., St. Louis 15, Missouri
 David Brown Corp. (Sales) Ltd., 96-97 Picca-
 dilly, London, W. 1, England
 BROWN INC., DAVID, 996 BRECHER ST.,
 SAN LEANDRO, CALIF.
 Brown, Industries, David, Meltham, Hudders-
 field, England
 Brown Boveri & Cie. AG, Mannheim, Ger-
 many
 BRUNNER & LAY, INC., 9366 KING ST.,
 FRANKLIN PARK, ILL.
 Buck & Associates, Clegg, Essex Falls, N.J.
 BUCYRUS-ERIE CO., P.O. BOX 46, SOUTH
 MILWAUKEE, WIS.
 Bucyrus-Erie Co., Drill Div., P.O. Box 324,
 Richmond, Ind.
 Buell Engineering Co., Inc., 70 Pine St., New
 York 6, New York
 Bullard Co., E. D., 2680 Bridgeway, Sausalito,
 Calif.
 BUNKER HILL & SULLIVAN MINING &
 CONCENTRATING CO., BOX 23, KEL-
 LOGG, IDAHO
 Butler Mfg. Co., 7480 E. 19th St., Kansas
 City 26, Mo.
 Bush Engineering & Mfg. Co., 5 Lester Ct.,
 Salt Lake City, Utah
 Byron Jackson Pumps, Inc., P.O. Box 2017A,
 Terminal Annex, Los Angeles, Calif.

C

C & D Batteries, Inc., Washington & Cherry
 Sts., Conshohocken, Pa.
 Calumet & Hecla, Inc., Calumet Div., 1 Calu-
 met Ave., Calumet, Mich.
 Canada Wire & Cable Co., Ltd., P. S. "R,"
 Toronto 17, Ontario, Canada
 Canadian Aero Service Ltd., 248 Queen St.,
 Ottawa 4, Ontario, Canada
 Canadian Safety Fuse Co. Ltd., Brownburg,
 Quebec, Canada
 Canton Mfg. Co., 2409 19th St., N. E., Canton
 6, Ohio
 Carborundum Co., The, Refractories Div.,
 Perth Amboy, N.J.
 CARD IRON WORKS CO., THE C. S., P.O.
 BOX 117, DENVER 1, COLO.
 Cardox Corp., 307 N. Michigan Ave., Chicago,
 Ill.
 Carey, Philip, Mfg. Co., Wayne Ave. At
 Cooper, Cincinnati, Ohio

Carlson Products Corp., 19225 Meech Ave.,
 Cleveland 6, Ohio
 Carlisle Rubber Co., Inc., 193-107 Warren St.,
 New York 7, N.Y.
 Carol Cable Co., 190 Middle St., Pawtucket,
 Rhode Island
 Carper Mfg. Inc., P.O. Box 3272, Station F,
 Jacksonville 6, Fla.
 Carrier Corp., Carrier Parkway, Syracuse,
 N.Y.
 Carrier Conveyor Corp., 211 N. Jackson St.,
 Louisville, Ky.
 Caterpillar Tractor Co., Peoria, Illinois
 Casati S. A., P.O. Box 241, Luzzemborg
 CEMENT GUN CO., ALLENTOWN, PA.
 Cementation Co., Ltd.—The Bentley Works,
 Doncaster. Head office: 29 Albert Embank-
 ment, London SE 11.
 Central Frog & Switch Co., The, Box 96, Sta.
 O, Cincinnati 5, Ohio
 Central Mine Equipment Co., 6200 N. Broad-
 way, St. Louis 15, Mo.
 Central Scientific Co. of California, 1040 Mar-
 tin Ave., Santa Clara, Calif.
 Centrifugal & Mechanical Industries, Inc., 146
 President St., St. Louis 18, Mo.
 Cesalpinia s.p.a., Via Felice-Casati 44, Milan,
 Italy
 Chain Belt Co., 4701 West Greenfield Ave.,
 Milwaukee 1, Wis.
 Channon Corp., J. H., 1447-55 West Hubbard
 St., Chicago 22, Ill.
 Chapman, Wood & Griswold, 586 Jefferson St.,
 N.E., Albuquerque, N.M.
 Chase Brass & Copper Co., 296 Grand St.,
 Newbury 20, Conn.
 Chassey Engineering Co. Ltd., Station
 Works, Hertford, Herts., England
 Chester Hoist—see National Screw & Mfg. Co.
 Chicago Eye Shield Co., 2727 W. Roscoe St.,
 Chicago 18, Ill.
 CHICAGO PNEUMATIC TOOL CO., 8 EAST
 14TH ST., NEW YORK, N.Y.
 Chikuma Co., 39 N. Pomona Ave., Brea, Calif.
 CHRISTENSEN DIAMOND PRODUCTS
 CO., 1937 S 2ND WEST P.O. 387, SALT
 LAKE CITY, UTAH
 Chrysler Corp.—Dodge Div., 21500 Mound
 Road, Detroit 31, Mich.
 Circle Wire & Cable Corp., 5500 Maspeth Ave.,
 N. Maspeth, N.Y.
 CLARK EQUIPMENT CO., CONSTRUCTION
 MACHINERY DIV., P.O. BOX 599, PIPE-
 STONE PLANT BENTON HARBOR,
 MICH.
 Clarkson Co., The, 564 Market St., San Fran-
 cisco 4, Calif.
 Cleveland Rock Drill Div., Westinghouse Air
 Brake Co., Cleveland, Ohio
 Cleveland Vibrator Co., The, 2325 Clinton
 Ave., Cleveland 13, Ohio
 Cleveland Wire Cloth & Mfg. Co., 3573 E.
 78th St., Cleveland 6, Ohio
 Cleveland Worm & Gear Co., The, 3300 East
 80th St., Cleveland 4, Ohio
 Climax Molybdenum Co., 500 Fifth Ave., N.Y.
 36, N.Y.
 Climax Rock Drill & Engineering Works, Ltd.,
 4 Broad St. Place, London, E.C.2, Eng-
 land
 Clipper Belt Laser Co., 974 Front Ave., N.W.,
 Grand Rapids 2, Mich.
 Clyde Iron Works, Inc., Duluth 1, Minnesota
 COAST MFG. & SUPPLY CO., BOX 71,
 LIVERMORE, CALIF.
 Coates Steel Products Co., P.O. Box 185, 1937
 Franklin Ave., Greenville, Ill.
 Coeur d'Alene Hardware & Foundry Co., Box
 969, Wallace, Idaho
 Coffing Hoist Div., Duff Norton Co., Danville,
 Ill.
 COLEMAN CABLE & WIRE CO., 3919 WE-
 LLY TERRACE, SCHILLER PARK, ILL.
 Collier Insulated Wire Co., 249 Roosevelt Ave.,
 Pawtucket, R.I.
 Colonial Plastics Mfg. Co., 2685 E. 79th St.,
 Cleveland 4, Ohio
 COLORADO ASSAYING CO., THE, 2244
 BROADWAY, DENVER 1, COLO.
 COLORADO FUEL & IRON CORP., P.O.
 BOX 1929, DENVER, COLO.
 COLUMBIA STEEL CASTING CO., INC.,
 933 N. W. JOHNSON ST., PORTLAND 9,
 ORE.
 Columbia Steel Tank Co., 1509 West 12th St.,
 Kansas City 1, Mo.
 Combustion Engineering Inc., Raymond Div.,
 1132 West Blackhawk St., Chicago 22, Ill.
 Combustion Engineering, Inc., 200 Madison
 Ave., New York 16, New York
 Commercial Shearing & Stamping Co., 1775
 Logan Ave., Youngstown 1, Ohio
 Connecticut Telephone & Electric Corp.,
 Meriden, Conn.
 Connellville Mfg. & Mine Supply Co., 8 4th
 St., Connellsville, Pa.
 Conrad-Stork, P.O. Box 134, Haarlem, Nether-
 lands
 Consolidated Chemical Industries, 636 Califor-
 nia St., San Francisco 8, California
 Consolidated Pneumatic Tool Co. Ltd., 232
 Dawes Rd., London, S. W. 6, England
 Construction Mach. Co., Box 120, Waterloo,
 Iowa
 Continental Gin Co., 4600-5th Ave., South,
 Birmingham, Ala.
 Convair Inc., P.O. Box 9671, Pittsburgh 26,
 Pa.

Cooper-Bessemer Corp., The, Mount Vernon,
 Ohio
 Coppus Engineering Corp., 844 Park Ave.,
 Worcester 10, Mass.
 COWING & CO., INC., 1-16TH ST. S.W., BIR-
 MINGHAM, ALA.
 Crasellus Company, Ltd., 12 Clarges St., London
 W. 1, England
 Craig Carroll Co., 66 S.E. Belmont, (Box
 2208), Portland 14, Oregon
 Crane Co., 836 S. Michigan Ave., Chicago 5,
 Ill.
 Crescent Belt Fastener Co., 331-4th Ave., New
 York 16, N.Y.
 Crosley Bros. Ltd., Openshaw Manchester 11,
 England
 Crown Zellerbach Corp., Chem. Products Div.,
 Camas, Wash.
 Crucible Steel Co. of America, Henry W.
 Oliver Bldg., Mellon Square, P.O. Box 2518
 Pittsburgh 30, Pa.
 Crusher Eng. Div., Poor & Co., 400 Archi-
 tects Bldg., Philadelphia 3, Pa.
 Cummins Engine Co., Inc., Fifth & Union St.,
 Columbus, Ind.
 CURTIS-WRIGHT CORP., SOUTH BEND
 DIV., 701 W. CHIWEPPA AVE., SOUTH
 BEND, INDIANA
 Curtis-Wright Corp., Utica Div., Utica, Mich.
 Custom Assay Office, Box 811, El Paso, Texas

D

Dagenhardt-Utch KG, Elsem (KR-Siegen)
 Germany
 Dale, Wade M., 233 E. Polk St., Coalings,
 Calif.
 Davey Compressor Co., Kent, Ohio
 Davies Magnet Works Ltd., London Road,
 Wars, Hertfordshire, England
 Davis, John, & Sons (Derby) Ltd., All Saints
 Works, Derby, England
 Davis & Davis, 2532 Lambourn Ave., Salt
 Lake City, Utah
 Davison & Co. (Hexham) Ltd., Hexam-on-
 Tyne, England
 Dayton Rubber Co., Woodside Bldg., Green-
 ville, S. C.
 DEGGENDORFER, T. G., BOX 840, KEL-
 LOGG, IDAHO
 DEISTER CONCENTRATOR CO., 925 GLAS-
 GOW AVE., FORT WAYNE, IND.
 Deister Machine Co., 1938 E Wayne St., Ft.
 Wayne 4, Ind.
 DeLaval Steam Turbine Co., 300 Nottingham
 Way, Trenton 2, N. J.
 Deloro Stellite Ltd., Highlands Rd., Shirley,
 Solihull, Warwickshire, England
 Demag Aktiengesellschaft, Wolfgang-Reuter-
 Platz, Duisburg, Germany
 Demag Electrometallurg GmbH, Wolfgang-
 Reuter-Platz, Duisburg, Germany
 DENVER EQUIPMENT CO., Box 3268 (1400-
 17TH ST.), DENVER 17, COLO.
 DENVER FIRE CLAY CO., 2301 BLAKE ST.,
 P.O. BOX 5510, DENVER 17, COLORADO
 DE SOUSA & CO., J. E., INC., 217 BROAD-
 WAY, NEW YORK, N.Y.
 DIAMOND DRILL CONTRACTING CO.,
 SOUTH 18 STONE ST., P.O. BOX 4465,
 STATION B, SPOKANE, WASHING-
 TON
 DIAMOND TOOL RESEARCH CO., INC., 380
 2ND AVE., N.Y. 10, N.Y.
 Dicalite Div., Great Lakes Carbon Corp., 612
 So. Flower St., Los Angeles, Calif.
 DICKSON LABORATORIES, 1809 W.
 MAIN ST., BOX 7096, EL PASO, TEXAS
 DIESEL ENERGY CORP., 82 BEAVER ST.,
 NEW YORK, N.Y.—SEE KLOCKNER-
 HUMBOLDT-DEUTZ
 Dietzgen Co., Eugene, 2425 North Sheffield,
 Chicago, Ill.
 Differential Steel Car Co., Findlay, Ohio
 Dings Magnetic Separator Co., 4740 West
 Electric Ave., Milwaukee 46, Wis.
 Distington Engineering Co. Ltd., P.O. Box 8,
 Workington, Cumberland
 Dodge Mfg. Corp., S. Union St., Mishawaka,
 Ind.
 Dolmar Maschinen Fabrik, Kedenburg Strasse
 53-59, Hamburg-Wandsbeck, Germany
 Dorman & Co. Ltd., W.H. Tirlal Road Works,
 Stafford, England
 DORR-OLIVER INC., BARRY PLACE,
 STAMFORD, CONN.
 Dorr Oliver GmbH, Gustav-Freytag Strasse 9,
 Wiesbaden, Germany
 DOW CHEMICAL CO., THE, MIDLAND,
 MICH.
 Dowty Mining Equipment Ltd., Ashchurch,
 Tewkesbury, Glos., England
 DRAVO CORP., NEVILLE ISLAND, PITTS-
 BURG 25, PA.
 Drilling Accessory & Mfg. Co., Inc., P. O.
 Box 6763, 2006 S. Industrial, Dallas, Texas
 Drott Mfg. Corp., 2841 W. Wisconsin Ave.,
 Milwaukee 8, Wis.
 Ducon Co., 152 E. 2nd St., Minneola, N.Y.
 DUNHAM MFG. & SALES CO., GORDON S.,
 853 MISSION ST., SO. PASADENA,
 CALIF.
 Dunlop Rubber Co., Ltd., 10/12 King St., St.
 James, London, S.W.1, England
 duPont de Nemours & Co., E. I. Chemicals
 Dept., duPont Bldg., Wilmington, Del.
 DUPONT DE NEMOURS & CO., INC., EX-
 PLOSIVES DIV., WILMINGTON 98,
 DELAWARE

DuPont de Nemours & Co., Inc., Fabrics Div.,
Newburgh, N.Y.
Duriron Co., Inc., The, 450 N. Findlay St.,
Dayton 1, Ohio
Dusterloh, G. Fabrik fur Bergwerksbedarf
GmbH, Hauptstrasse 79, Sprockhovel
(Westf.)
Dwight-Lloyd Div., McDowell Co., Inc., The
Dynamatic Div., Eaton Mfg. Co., 3307-14th
Ave., Kenosha, Wisconsin

E

Eagle Crusher Co., Gallon, Ohio
Eagle Iron Works, 261 Holcomb Ave., Des
Moines, Iowa
Easton Car & Construction Co., Easton, Pa.
Easton Manufacturing Co., Dynamatic Div.,
3122 14th Ave., Kenosha, Wisconsin
Eberhard Bauer GmbH, Esslingen Neckar,
W. Germany
EBERLINE INSTRUMENT CORP., 885
EARLY ST., P.O. BOX 279, SANTA FE,
NEW MEXICO
Economy Fuse & Mfg. Co., 2717 Greenview
Ave., Chicago, Ill.
Edison, Inc., Thomas A., Edison Storage Battery
Div., West Orange, N.J.
E. H. Edwards Co., P.O. Box 513, So. San
Francisco, Calif.
Eickhoff, Gebr. Maschinenfabrik u. Eisengies-
serei GmbH, Bochum, Germany
EIMCO CORP., P.O. BOX 390, SALT LAKE
CITY 10, UTAH
EISENHUTTE PRINZ RUDOLPH, A.G., DUL-
MAN/WESTF., GERMANY
Eisenwerke Muhlheim/Meiderich A.G. (23a)
Muhlheim-Ruhr, Postfach 420, Germany
Electric Controller & Mfg. Co., 4614 Lee
Road, Cleveland 28, Ohio
Electric Machinery Mfg. Co., 800 Central Ave.,
Minneapolis 13, Minn.
ELECTRIC STEEL FOUNDRY CO., 2141 NW
35TH AVE., PORTLAND 10, ORE.
ELECTRIC STORAGE BATTERY CO., EXIDE
INDUSTRIAL DIVISION, RISING SUN &
ADAMS AVES., PHILADELPHIA 20, PA.
Electro Technical Labs Div., Mandrel Indus-
tries, 5134 Glenmont Drive, Houston 19,
Texas
Elektrotechnik A. S., 101 Park Ave., New York
17, N.Y.
ELIOTT, D. H., P.O. BOX 1007, CASPER,
WYO.
ELLICOTT MACHINE CORP., 1611 BUSH
ST., BALTIMORE, MD.
Elreco Corp., 2906 Cornum Ave., Cincinnati
25, Ohio
El Paso Testing Laboratories, El Paso, Tex.
Emery Industries, Inc., Carew Tower, Cincin-
nati 2, Ohio
English Drilling Equipment Co. Ltd., Palace
Chambers, Bridge St., Westminster, Lon-
don, S.W. 1, England
English Electric Export & Trading Co., Ltd.,
Stafford, England
English Steel Corp., Ltd., River Don Works,
Sheffield, England
Ensign-Bickford Co., Hopmeadow St., P.O. Box
308, Simsbury, Conn.
Enterprise Eng. & Mach. Co., 18th & Florida
St., S.F. 10, Calif.
Equipment Engineers Inc., 737 Loma Verde,
Falo Alto, Calif.
Erbo Maschinenbau, Erley & Bonninger, Bahn-
hofstrasse 268, Haslinghausen, Germany
Erie Pump & Engine Works, 165 Glenwood
Ave., Medina, N.Y.
Eriez Mfg. Co., 278 Magnet Drive, Erie, Pa.
Erich-Werke K.G., Duisburg, West Germany
ESCO INTERNATIONAL GRAYBAR BLDG.,
2519 LEXINGTON AVE., NEW YORK 17,
N.Y.
Essex Wire Corp., 1601 Wall Street, Fort
Wayne 6, Ind.
Essex Wire Corp., Parante Wire & Cable Div.,
1601 Wall St., Ft. Wayne, Ind.
Esso Standard Oil Co., 18 West 51st St.,
New York 19, N.Y.
Esterline-Angus Co., Inc., P.O. Box 596,
Indianapolis 6, Ind.
EUCLID DIVISION, SEE GENERAL
MOTORS CORP.
Euclid Electric & Mfg. Co., 50 Edwards St.,
Madison, Ohio
Eutectic Welding Alloys Corp., 40-40 172nd
St., Flushing 55, N.Y.
Exolon Co., The, Tonawanda, N.Y.

F

Fa. Ten Pas & Co., 140 Zeglis, Alkmaar,
Netherlands
Fagersta AB, Fagersta, Sweden
Fagerut Fabrikker, A/S, P.O. Box 22, Dram-
men, Norway
Falling Co., Geo. E., 424 E. Broadway, Enid,
Oklahoma

Fairbanks, Morse & Co., 600 S. Michigan Ave.,
Chicago 5, Ill.
FAIRCHILD AERIAL SURVEYS, INC., 274 E.
11th ST., LOS ANGELES, CALIF.
Falk Corp., The, 5004 W. Canal St., Mil-
waukee 1, Wis.
FARBWERKE HOECHST AG., FRANKFURT
(M)-HOECHST, WEST GERMANY
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farris Engineering Corp., 400 Commercial
Ave., Fallades Park, N.J.
Farval Corp., The, 3300 E. 30th St., Cleve-
land, Ohio
Fate-Root-Heath Co., The, Plymouth Locomo-
tive Wks. Div., Plymouth, Ohio
FEDERAL PIPE & TANK CO., 6851 EAST
MARGINAL WAY, SEATTLE 8, WASH.
Fielden Electronics Ltd., Wythenshawe, Man-
chester, England
Filter Fabrics, Inc., 1279 W. 3rd St., Cleveland
18, Ohio
Filtration Engineers Div. American Machine
& Metals, Inc., East Moline, Illinois
Firestone Tire & Rubber Co., 1200 Firestone
Pkwy., Akron 17, Ohio
First Sterling, Inc., 3113 Forbes Ave., Pitts-
burgh 30, Pa.
Fischer & Porter Co., 215 Westminster Rd.,
Hathboro, Pa.
Flaher Contracting Co., P.O. Box 6306,
Phoenix, Ariz.
Fisher Research Laboratory, Inc., 1975 Univer-
sity Ave., Palo Alto, Calif.
Fiske Brothers, Refining Co., Labriplate Div.,
129 Lockwood St., Newark 5, N.J.
Flexible Ducting Ltd., Maryhill, Glasgow,
N.W., Scotland
Flexible Steel Lacing Co., 4607 Lexington St.,
Chicago 44, Ill.
Flexible Tubing Corp., New Whitfield St.,
Guilford, Conn.
Flexible Valve Corp., 400 Commercial Ave.,
Fallades Park, N.J.
FLOTTMAN-WERKE GMBH, HERNE,
WESTF., WEST GERMANY
Fluidwick Co., 6319 E. Outer Dr., Detroit 34,
Mich.
Fluor Products Co., Fluor-Hartmann Div.,
12000 E. Washington Blvd., Whittier,
Calif.
FLUOR PRODUCTS CO., SANTA FE TANK
& TOWER DIV., 12000 E. WASHINGTON
BLVD., WHITTIER, CALIF.
Flygt Pumper GmbH, Georgstr. 36, Hannover,
Germany
Flygtz Pompen N.V., Groothandelsgebouw,
Weena 703, Rotterdam, Netherlands
FOOD MACHINERY & CHEM. CORP., JOHN
BEAN DIV., P.O. BOX 145, SAN JOSE 3,
CALIF.
Fodens Ltd., Sandbach, Cheshire, England
Food Machinery & Chemical Corp., Peerless
Pump Div., 301 West Avenue 26, Los
Angeles, Calif.
Foster Wheeler Corp., 666 Fifth Ave., New
York 19, N.Y.
Four Wheel Drive Auto Co., 12th Street,
Clintonville, Wis.
Foxboro Co., Foxboro, Mass.
Fraser & Chalmers Engr. Wks., Fraser Rd.,
Erith, Kent, England
FREDERICK, FRANCIS H., 690 MARKET
ST., SAN FRANCISCO 4, CALIF.
Frolich & Klupfel, Wuppertal-Barmen, W.
Germany
Fruehauf Trailer Co., 10940 Harper Ave.,
Detroit 32, Mich.

G

Galisher Co., 545 West 8th South St., P.O.
Box 209, Salt Lake City 10, Utah
Gallon Allstate Body Co., S. Market St.,
Gallon, Ohio
Gar Wood Industries, Inc., Wayne, Mich.
RALPH GARDNER & CO., 14112 LIMA RD.,
FT. WAYNE, IND.
GARDNER-DENVER CO., FRONT ST.,
QUINCY, ILL.
Garlock Packing Co., Palmyra, New York
Gates Rubber Co., 999 S. Broadway, Denver,
17, Colo.
General-American Valve Co., P.O. Box 444,
Corona Del Mar, Calif.
General Aniline & Film Corp., Ozalid Div.,
191 Anasco Road, Johnson City, N.Y.
GENERAL CABLE CORP., 429 LEXINGTON
AVE., NEW YORK, N.Y.
General Detroit Corp., 110 Mt. Elliott, Detroit,
Mich.
General Dynamics Corp., Electro Dynamic
Div., Avenue A, Bayonne, New Jersey
General Electric Co., Apparatus Sales Div., 1
River Rd., Schenectady 5, New York
General Electric Co., Carbonyl Dept., Box 287,
Roosevelt Park Place, Detroit 32, Mich.
General Electric Co., Wire & Cable Dept.,
Conduit Products Dept., 1285 Boston Ave.,
Bridgeport 2, Conn.
GENERAL ELECTRIC CO., INTERNATIONAL
AL 150 EAST 42ND ST., NEW YORK 17,
N.Y.
General Electric Co., Lamp Dept., Nela Park,
E. Cleveland 13, Ohio
General Electric Co., Metallurgical Products
Dept., 11177 E. 8 Mile Rd., Detroit 32,
Mich.

General Electric Co. of England, Ltd., The
Fraser & Chalmers Eng. Works, Erith,
Kent, England
General Equipment Co., Box 134, Owatonna,
Minnesota
General Fire Extinguisher Corp., 25631 Little
Mack, St. Clair Shores, Mich.
General Hardware Co., Milwaukee Waterway
at E. 11 St., Tacoma, Wash.
General Machinery Co., 3500 Riverside Ave.,
Spokane, Wash.
General Mills, Inc., Chemical Div., So. Ken-
sington Rd., Kankakee, Ill.
General Mills, Inc., Special Commodities Div.,
9200 Wayzata Blvd., Minneapolis 26, Minn.
General Motors Corp., Allison Div., P.O. Box
884, Indianapolis, Ind.
General Motors Corp., Delco Products Div.,
329 E. First St., Dayton, Ohio
General Motors Corp., Detroit Diesel Engine
Div., 15400 W. Outer Drive, Detroit 28,
Mich.
GENERAL MOTORS CORP., EUCLID DIV.,
1361 CHARDON RD., CLEVELAND 17,
OHIO
General Motors Corp., GMC Truck & Coach
Div., 440 S. Blvd., E. Pontiac 11, Mich.
General Motors Corp., 260 N. Main St., New
Departure Div., Bristol, Conn.
GENERAL MOTORS OVERSEAS OPERA-
TION, 1775 BROADWAY, NEW YORK
19, N.Y.
General Petroleum Corp., 612 S. Flower St.,
Los Angeles, Calif.
General Refractories Co., 1820 Locust St.,
Philadelphia 2, Pa.
General Tire & Rubber Co., Akron 1, Ohio
Gent & Co. Ltd., Faraday Works, Leicester,
England
Geodynamics, Inc., Box 173-c, Pasadena, Calif.
Geo. Enger., 304 Main St., Grand Junction, Colo.
Geo-Optic Co., Inc., 170 Broadway, New York
38, N.Y.
Geophysical Services, Inc., 5900 Lemmon St.,
Dallas 9, Texas
Geophysical Specialties Co., 4206 Longfellow
Ave., Minneapolis 7, Minn.
Gesellschaft fur Werkzeugmaschinen und Wirtschaft-
swerbung MBH, Steinstrasse 27, Dussel-
dorf, Germany
GETMAN BROS. MFG. DIV., INC., P.O. BOX
71, DUNKLEY AVE., SUNNY HAVEN,
MICH.
GODOY & CO., INC., E. A. CUNARD BLDG.,
25 BROADWAY, NEW YORK 4, N.Y.
GOODALL BROS. BOX 537, 46 S. MAIN ST.,
HELENA, MONTANA
GOODALL RUBBER CO., 430 WHITEHEAD
ROAD, TRENTON, N.J.
Goodman Mfg. Co., Halsted St. & 48th Pl.,
Chicago 9, Ill.
Goodrich Industrial Products Co., B.F., 500
S. Main St., Akron, Ohio
GOODRICH CO. B. F. INTERNATIONAL
INDUSTRIAL PROD. DIV., 500 S. MAIN
ST., AKRON, OHIO
Goodrich Tire Co., B.F., 500 S. Main St.,
Akron, Ohio
Goodyear Tire & Rubber Co., 1144 E. Market
St., Akron, Ohio
Gottwald, Leo, Werftstrasse, Dusseldorf, Ger-
many
GOULD & CO. GORDON I., 58 SUTTER ST.,
SAN FRANCISCO 4, CALIF.
Gould-National Batteries, Inc., Trenton 7, New
Jersey
Granby Cons. Mining Smelting & Power Co.,
Ltd., Copper Mt., British Columbia, Canada
Graphite Metallizing Corp., 1059 Nepperhan
Ave., Yonkers, N.Y.
GRAYBAR ELECTRIC CO., INC., 420 LEX-
INGTON AVE., NEW YORK 17, N.Y.
Greensburg Div., National Mine Service Co.,
102 Stanton St., Greensburg, Pa.
Grinnell Co., Inc., 260 West Exchange St.,
Providence, R. I.
Gripsholt Inc., 434 Bryant St., S.F. 7, Calif.
Gruendler Crusher & Pulverizer Co., 2917 N.
Market St., St. Louis, Mo.
Guest Keen Iron & Steel Co. Ltd., East Moors,
Cardiff, U.K.
Gulf Oil Corp.—Gulf Refining Co., 1822 Gulf
Bldg., P.O. Box 1164, Pittsburgh 30, Pa.
Gundlach Machine Co., Div. T. J. J. M. J.
Industries, Inc., 226 Centerville Ave.,
Belleville, Ill.
Gurley, W. & L. E., 514 Fulton St., Troy, N.Y.
Gustin Bacon Mfg. Co., 210 W. 10th St., Kan-
sas City, Mo.
Gutschhoffnungsbetriebe A.G., Oberhausen-Sterk-
rade, W. Germany

H

HACK ENGINEERING CO., 124 WAZEE
MARKET, DENVER, COLO.
HADFIELD LTD., EAST HECLA WORKS,
VULCAN RD., TINSLEY, SHEFFIELD 9,
YORKSHIRE, ENGLAND
Halse Mfg. Co., Inc., Geo., 330 5th Ave., N.Y.
N.Y.
Halliburton Oil Well Cementing Co., Duncan,
Oklahoma
Hammond Bag & Paper Co., Wellburg, W. Va.
Hankison Corp., College & Pike, Canonsburg,
Pa.

Hanks, Inc., Abbott A., 1300 Sansome St., San Francisco 11, Calif.
 Hanover Industries, Inc., 77 Veteran St., Meriden, Conn.
 Harrison-Walker Refractories Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
HARDINGE CO., INC., 240 ARCH ST., YORK, PA.
HARNISCHFEGGER CORP., 4490 W. NATIONAL AVE., MILWAUKEE 48, WIS.
HARNISCHFEGGER EXPORT CORP., SEE HARNISCHFEGGER CORP.
 Harnischfeger Int'l Corp., GmbH, Allee 28, 33, Düsseldorf, Germany
 Harrison-Walker Refractories, 307-5th Ave., Pittsburgh 22, Pa.
 Hartmann, Maschinenfabrik, AG, Waldstrasse 230, Offenbach-Main, Germany
 Harvey, G. A. & Co. (London) Ltd., Woolwich Rd., London, S.E. 7, England
 Haasenclever, Maschinenfabrik, AG, Wittelsstrasse 55, Düsseldorf, Germany
 Haubert, Rudolf & Son, Maschinenfabrik, Albersfelderstrasse 53, Sprockhovel (Westf.), Germany
 Havlicek, J. L., 112 S. Cedar St., Spokane, Wash.
 Hawley & Hawley Assayer & Chemists, Inc., 537-21st St., Douglas, Ariz.
 Hawthorne, Herb J. Inc., P.O. Box 7346, Houston 2, Texas
 Haynes Steel Co., Div. of Union Carbide Corp., 735 S. Lindsay St., Kokomo, Ind.
 Hayward Tyler & Co. Ltd., Luton, Beds, England
HAZEMAG OF GERMANY, P.O. BOX 576, MUNSTER (WESTFALEN), GERMANY
 Hazmag USA, Inc., 122 E. 42nd St., New York 17, N.Y.
HEAD WRIGHTSON, STOCKTON FORGE LTD., NOTTON ROAD, STOCKTON-ON-TES, ENGLAND
 Heinrichs Geoprospection Co., P.O. Box 5671, Tucson, Ariz.
 Hall Co., 8000 W. Montana St., Milwaukee 1, Wis.
 Hemscheidt, Hermann Maschinenfabrik, Bornberg 97-108, Wuppertal, W. Germany
 Hendrick Mfg. Co., Carbondale, Pa.
 Hercules Gallon Products, Inc., Gallon, Ohio
 Hercules Motors Corp., 101 East 11th St., S.E., Canton 2, Ohio
HERCULES POWDER CO., 980 MARKET ST., WILMINGTON, DEL.
 Hercules Steel Products Co., Sherman St., Gallon, Ohio
 Hermann von Rautenkranz, Internationale Tiefbohr, Komm-Ges., (ITAG) Celle
 Hewl Duty Electric Co., 2040 W. Wisconsin Ave., Milwaukee 1, Wis.
HEWITT-ROBINS INC., HEWITT RUBBER DIV., 248 KENSINGTON AVE., BUFFALO 5, N.Y.
HEWITT-ROBINS INC., ROBINS CONVEYORS DIV., WIRE PRODUCTS PLANT, HENDERSON RD. & QUEEN'S DR., KING OF PRUSSIA, PA. (FORMERLY: KORB PETTIT, INC.)
 Heyl & Patterson, Inc., 55 Fort Pitt Blvd., Pittsburgh 22, Pa.
 Hirsch Bros. Machy. Co., P.O. Box 226, El Paso, Tex.
 Hitchcock Mfg. Co., Leo, 12915 Wicks St., Sun Valley, Calif.
 Hobart Bros. Co., Hobart Sq., Troy, Ohio
 Hockensmith Corp., The Penn., Pennsylvania
 Hoffman Bros. Drilling Co., 120 E. Mahoning St., Punxsutawney, Pa.
 Holman Bros. (Canada) Ltd., Kent Ave., Kitchener, Ontario, Canada
 Holman Bros., Ltd., Camborne, Cornwall, England
 Moltzer-Cabot—see National Pneumatic Co., Inc.
 Mometite Div., Textron, Inc., Riverdale Ave., Port Chester, New York
 Homer Mfg. Div., The Ohio Electric Mfg. Co., 142 East Pearl St., Lima, Ohio
 Home Accessories Co., Le-Bell Div., 17th & Lehigh Ave., Philadelphia 32, Pa.
 Home Accessories Co., Champ Industries Div., Lehigh Ave. & 17th St., Phila. 32, Pa.
 Mosfeld Mfg. Co., 460-463 West Third St., Winona, Minn.
 Hough Co., The Frank G., 880 Sunnyside Ave., Libertyville, Ill.
 Houghton & Co. E. F., 303 W. Lehigh Ave., Philadelphia 32, Pa.
 Howe Scale Co., Inc., Rutland, Vermont
 Howell Electric Motors Co., 409 N. Roosevelt St., Howell, Mich.
 Huber-Warso Co., 303 N. Greenwood St., Marion, Ohio
 Hudson, Robert Ltd., Raistrux House, Meadow Lane, Leeds 11, York, England
 Hughes Tool Co., P.O. Box 2339, Houston 1, Texas
 Hulin, Carlton D., 35 Eucalyptus Path, Berkeley 5, Calif.
 Humboldt, Klockner-Humboldt-Deuts A. G.—see Diesel Energy Corp. Cologne, Kalk, Western Germany
 Humphreys Engineering Co., 910 First National Bank Bldg., Denver 2, Colo.
 Hunslet Engine Co. Ltd., The—125, Jack Lane, Hunslet, Leeds 10, England
 Hunting Airborne Geophysics Ltd., 1450 O'Connor Dr., Toronto 16, Ontario, Canada

Hunting Geophysical Services, Inc., 57 Park Ave., New York 17, N.Y.
 Hunting Technical & Exploration Services, Ltd., 57 Park Ave., New York 16, N.Y.
 Hunting Technical Services, Inc., 57 Park Ave., New York 16, N.Y.
 Huntington, Heberlein & Co., Ltd., Simon House, 23-29 Dover St., London, W.1, England
 Mycon Aerial Surveys, Inc., 1020 S. Arroyo Parkway, Pasadena, Calif.
 Hydraulic Supply Mfg. Co., 7500 8th Ave. So., Seattle, Wash.
 Hyster Co., 2902 N.E. Clackamas St., Portland 3, Oregon

I-T-E Circuit Breaker Co., 1900 Hamilton St., Philadelphia 30, Pa.
 Ideal Corp., 435 Liberty Ave., Brooklyn 7, N.Y.
 Ideal Electric & Mfg. Co., Mansfield, Ohio
 Ideal Industries, Inc., 3624 Park Ave., Sycamore, Ill.
 Illinois Powder Mfg. Co., 506 Olive St., St. Louis, Mo.
 Imperial Chemical Industries, Ltd., Imperial Chem. House, Millbank, London, S.W.1, England
 Imperial Oil & Grease Co., 6505 Wilshire Blvd., Los Angeles 48, Calif.
 Industrial Air Products Co., 3200 N.W. Yeon Ave., Portland 10, Ore.
 Industrial Coupler Co., P.O. Box 1751, E. 4218 Boone Ave., Spokane, Wash.
INDUSTRIAL PHYSICS & ELECTRONICS CO., 470 S. 10TH E., SALT LAKE CITY 2, UTAH
 Inflico, Inc., 9015 Campbell Ave., P.O. Box 5035, Tucson, Ariz.
 Ingersoll, Guy E., 5505 Timberwolf Drive, El Paso, Texas
INGERSOLL-RAND CO., 11 BROADWAY, NEW YORK 4, N.Y.
INTERNATIONAL B. F. GOODRICH, 500 SOUTH MAIN ST., AKRON 15, OHIO
 International Combustion Ltd., 19 Woburn Place, London W.C. 1, England
 International General Electric Co., 670 Lexington Ave., New York 21, N.Y.
 International Geophysics, Inc., 2500 West Coast Hwy., Newport, Calif.
 Internat'l Harvester Export Co., 180 N. Michigan Ave., Chicago 1, Ill.
INTERNAT'L HARVESTER EXPORT CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.
INTERNATIONAL MINERALS & METALS CORP., 11 BROADWAY, NEW YORK 4, N.Y.—SEE ORE BUYERS GUIDE, PG. 139
INTERNAT'L SMELTING & REFINING CO., 312 KLEARS BLDG., SALT LAKE CITY, UTAH
 Iowa Mfg. Co., Cedar Rapids, Iowa
 Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland 11, Ohio
 Irwin Foundry & Mine Car Co., P.O. Box 311, Irwin, Pa.
 Isbell Construction Co., P.O. Box 2351, Reno, Nevada

Jaeger Machine Co., 687 Dublin Ave., Columbus, Ohio
 James Equipment, Inc., 712 Rockefeller St., Elizabeth, N.J.
 Jeffrey Mfg. Co., 361 N. 4th St., Columbus 16, Ohio
 Jet-Lube, Inc., 7262 West Beverly Blvd., Los Angeles 34, Calif.
 Johns-Manville Sales Corp., 22 East 40th St., New York 16, N.Y.
 Johnson, Herbert Banks, 304 Franklin St., Clearwater, Fla.
JOHNSON-MARCH CORP., 1724 CHESTNUT ST., PHILADELPHIA 3, PA.
 Johnson & Phillips Ltd., Victoria Way, Charlton, London, S.E. 7, England
 Johnston Pump Co., 2272 E. Foothill, Pasadena, Calif.
 Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.
JOY MFG. CO., HENRY W. OLIVER BLDG., PITTSBURGH 22, PA.
 Joy Sullivan Ltd., Cappelow, Greenock, Scotland
 Junction Bit & Tool Co., P.O. Box 1951, Grand Junction, Colo.
 Justrite Mfg. Co., 3061 N. Southport, Chicago 14, Ill.

KW-DART TRUCK CO., 2621 OAK ST., KANSAS CITY, MO.
 Kaelble, Carl GmbH, Backnang Nr. Stuttgart, W. Germany

Kaiser Aluminum & Chem. Corp., 1924 Broadway, Oakland 12, Calif.
 Kaiser Engineers, 1924 Broadway, Oakland 12, Calif.
 Kaiser Steel Corp., 1924 Broadway, Oakland, Calif.
 Ka-Mo Tools, Inc., 1845 So. 55 Ave., Cicero 59, Ill.
 Kato Engineering Co., 1415 First Ave., Mankato, Minn.
KENEY, PAUL E. CO., 1125 S. E. GRAND AVE., PORTLAND 14, ORE.
KEMA (Kohn-Ehrenfelder Maschinenbau-Austalt GmbH) Vogeisangerstr., 250, Kohn-Ehrenfeld, Germany
 Kenco, 10081 Carmon Road, Cupertino, California, P.O. Box 174
 Kennametal Inc., Miningtool Div., Bedford, Pa.
KENNEDY-VAN SAUN MFG. & ENG. CORP., 465 PARK AVE., NEW YORK 16, N.Y.
 Kern Instruments, Inc., 120 Grand St., White Plains, N.Y.
 Koufal & Esner Co., 300 Adams St., Hoboken, N.J.
 Keystone Lubricating Co., 21st & Lippincott Sts., Philadelphia 32, Pa.
 Kiddle, Walter & Co., Inc., 456 Main St., Belleville 9, N.J.
 Klein, Schanzlin & Becker, Stuttgart, Germany
 Klockner-Humboldt-Deuts Ag., Kohn, Germany—see Diesel Energy Corp.
 Knapp & Bates Ltd., 17, Christopher St., Finsbury Sq., London, E. C. 2
 Knapp & Bates Ltd., Africa House, Kingsway, London W.C. 2, England
KNAPSACK-GRIESHHEIM A.G. (SEE FARBWERKE HOESCHT)
 Koebel Diamond Tool Co., 9456 Grinnell Ave., Detroit 13, Mich.
 Koshing Co., 3026 West Concordia Ave., Milwaukee 16, Wis.
 Kohler Co., Kohler, Wis.
 Koppers Co., Wood Pres. Div., 700 Koppers Bldg., Pittsburgh, Pa.
 Koppers Co., Inc., Wolman Dept., 700 Koppers Bldg., Pittsburgh, Pa.
 Kraloy Plastic Pipe Co., Inc., 4730 E. Washington Blvd., Los Angeles 2, Calif.
 Krebs, Kallerg, 554 Market St., San Francisco 4, Calif.
 Krupp, Fried. Maschinen u. Stahlbau, Rheinhäusen, W. Germany
 Kuhlman Electric Co., Box 239, Birmingham, Michigan

Labour Co., 1607 Sterling Ave., Elkhart, Ind.
LAKE SHORE INC., LAKE SHORE ENG. DIV., BOX 911, IRON MTN., MICH.
 Lancashire Dynamo & Crypto Ltd., Trafford Park, Manchester 17, England
 Landis Steel Co., Box 248, 116 West A St., Fisher, Okla.
 Lahr, Instruments, Inc., 1709 B. Rockville Pike, Rockville, Maryland
 Laughlin Co., Thomas, 143 Fore St., Portland 6, Maine
 Lead Lined Iron Pipe Co., 33 Broadway, Wakefield, Mass.
 Lecommet Furnace Div., McGraw Edison Co., P.O. Box 1257, Pittsburgh, Pa.
 Leeden Mfg. Co., Div. of Leeden, Inc., 3333 N. Gilman Rd., El Monte, Calif.
 Ledoux & Co., 359 Alfred Ave., Teaneck, N.J.
 Leeds & Northrup Co., 4901 Stenton Ave., Phila. 44, Pa.
 Lee Rubber & Tire Corp., Republic Rubber Div., 1410 Albert St., Youngstown, Ohio
 Lehigh Safety Shoe Co., First & Miner Sts., Emmaus, Pa.
 Lerch Bros. Inc., P.O. Box 810, Hibbing, Minn.
 Le Roi Div., Westinghouse Airbrake Co., 3715 W. Wisconsin Ave., Milwaukee, Wis.
 Leschen Wire Rope Div., H. K. Porter Co., 2727 Hamilton Ave., St. Louis 12, Mo.
LETOURNEAU-WESTINGHOUSE CO., 2391 N. ADAMS ST., PEORIA, ILL.
 Libu Shovel Co. AB, Sturevagen 13, Stockholm, Sweden (Subsidi. in England: Libu Shovel Co. Ltd., Amersham Common, Bucks, England)
 Lima Electric Motor Co., Findlay Road, Lima, Ohio
LINATEX CORP. OF AMERICA, VERNON AVE., ROCKVILLE, CONNECTICUT
 Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio
 Lindqvist & Cie, 32 Avenue de l'Opera, Paris, France
 Linde Air Products Co., 30 E. 42nd St., New York 17, N.Y.
 Link-Belt Co., Dept. 59-WML, 233 Broadway, New York 7, N.Y.
LINK-BELT CO., PRUDENTIAL PLAZA, DEPT. WMD-57, CHICAGO, ILL.
 Link-Belt Speeder Corp., 1261 Sixth St., S.W., Cedar Rapids, Iowa
 Lippmann Engineering Works, 4005 W. Mitchell St., Milwaukee 14, Wis.
 Liqui-Solid Separations Ltd., 2 Anderson St., London, S.W.3, England

Live Roller Mills Mfg. Co., 476 E. Twain,
Fresno 26, Calif.
Livingston & Wilson Exploration & Drilling
Co., Longmont, Colo.
Loesche Hartzerkleinerrungs-u. Zementmaschi-
nen K.G., Steinstrasse 18—Dusseldorf, W.
Germany
Locomotive Crane Div., McDowell Co., Inc.,
The
LOGAN ENGR. CO., 4981 WEST LAWRENCE
AVE., CHICAGO 36, ILL.
LONGYEAR CO., E. J., 78 SO. 8TH ST.,
MINNEAPOLIS 2, MINN.
LOOFBOUROW, R. L., 4632 QUEEN AVE.
SO., MINNEAPOLIS 13, MINN.
Los Angeles Scientific Instrument Co., 2451
Riverside Drive, Los Angeles 39, California
Ludlow-Saylor Wire Cloth Co., 634 South New-
stead Ave., St. Louis 10, Mo.
Lufkin Rule Co., Saginaw, Mich.
Lug-All Co., 885 E. Lancaster, Haverford, Pa.
Lundberg Exploration, Ltd., 96 Eglinton Ave.
E., Toronto 2, Ontario, Canada
LURGI-GES. F. CHEMI & HUETTENWESEN
M.B.H., LURGINHAUS, GERVINUSSTRAS-
SE, FRANKFURT MAIN, GERMANY

M

M-R-S. Mfg. Co., Flora, Miss.
MacAfee & Co., 8105 Whishire Blvd., Los An-
geles 5, Calif.
MACE CO., THE, 2743 BLAKE ST., DEN-
VER 5, COLO.
MACK TRUCKS, INC., EMPIRE STATE
BLDG., NEW YORK 1, N.Y.
Mackay Industrial Equipment Ltd., Faggs Rd.,
Feltham, Middlesex
MacWylie Inc., 2908 14th Ave., Kenosha, Wis.
MAGMA COPPER CO., SUPERIOR, ARI-
ZONA
Magnetic Engineering & Mfg. Co., 1120 Van
Houten Ave., Clifton, N.J.
MAGOR CAR CORP., 58 CHURCH ST., NEW
YORK 7, N.Y.
Mahogany Importing Co., 725 S. Spring St.,
Los Angeles 14, Calif.
Manha Storage Battery Locomotive Div.,
Goodman Mfg. Co., Halsted & 48th Pl.,
Chicago 9, Ill.
MANITOWOC ENGINEERING CORP., SOUTH
16TH ST., MANITOWOC, WIS.
Manncmann Export G.m.b.H., Thomastrasse
6, Dusseldorf, Germany
Manning Co., Chas. E., 4700 Clairton Blvd.,
Pittsburgh 36, Pa.
MARION POWER SHOVEL CO., 617 W.
CENTER ST., MARION, OHIO
Markley Dust Control System, Inc., 80 Snyder
Road, Ramsey, N.J.
Marlin-Rockwell Corp., 402 Chandler St.,
Jamestown, N.Y.
Marmion-Herrington Co., Inc., 1511 W. Wash-
ington St., Indianapolis 7, Ind.
Martin Black & Co. (Wire Ropes) Ltd., Speed-
well Works, Coatbridge, Scotland
Martindale Electric Co., 1332 Hird Ave.,
Cleveland 7, Ohio
Maschinenfabrik Augsburg-Nurnberg AG,
(M.A.N.) Nurnberg, West Germany
Mather & Platt Ltd. Park Works, Manchester
10, England
Mavor & Coulson Ltd., Bridgeton Glasgow
S.E. Scotland
Maybew Supply Co., P.O. Box 7728, Dallas,
Texas
Mayo Tunnel & Mine Equip., Box 1413, Lan-
caster, Pa.
McCauley Industrial Corp., 1840 Howell Ave.,
Dayton, Ohio
McDonald, T. J., 14408 St. Marys, Detroit 27,
Mich.
McDowell Co., Inc., The Wellman Engineering
Co., 113 St. Clair Ave., Cleveland 2, Ohio
McGraw-Edison Co., Thomas A. Edison In-
dustries, Storage Battery Div., West
Orange, N.J.
McKenzie & Whittle Cont., P.O. Box 5602,
Dallas, Texas
MCLANAHAN & STONE CORP., HOLLI-
DAYSBURG, PA.
McMillan, W. D., 1009 Grant St., Apt. 9, Den-
ver 3, Colo.
McNally Pittsburgh Mfg. Corp., Drawer D,
307 W. 3rd St., Pittsburgh, Kansas
Menlo Research Lab., Box 822, Menlo Park,
Calif.
Merriek Scale Mfg. Co., 130 Autumn St., Pas-
aic, N.J.
Mersey Cable Works Ltd., Linacre Lane,
Bootle, Liverpool 29, England
Merton Engineering Co. Ltd., Faggs Road, Fel-
tham Middx., England
Metal Carbides Corp., 6001 Southern Blvd.,
Youngstown, Ohio
Metron Instrument Co., 432 Lincoln St., Den-
ver, Colo.
Metropolitan-Vickers Electrical Co., Ltd., Mos-
ley Rd., Trafford Park, Manchester 17,
England
Mexico Refractories Co., Coal & Love Sts.,
Mexico, Mo.
Micro Switch, div. of Minneapolis-Honeywell
Regulator Co., Chicago & Spring Sts.,
Freepoint, Ill.
Mill & Mine Supply, Inc., 505 Lander St.,
Seattle 4, Wash.
Mills Iron Works, Inc., 929 North Main St.,
Los Angeles 18, Calif.

John Mills & Co. (Llanidloes, Ltd.) Railway
Foundry, Llanidloes, Montgomeryshire,
United Kingdom
Minerals Et. Metaux, Societe Anonyme, 28 Rue
Arthur Rozier, Paris XIX, France
Minerac Corp., 120 Broadway, New York, N.Y.
MINE SAFETY APPLIANCES CO., 201 N.
BRADDOCK AVE., PITTSBURGH 4, PA.
MINE & SMELTER SUPPLY CO., MANU-
FACTURING DIV., 3509 RACE ST., DEN-
VER, COLO.
MINERS FOUNDRY & MFG. CO., 300
SPRING ST., NEVADA CITY, CALIF.
Mining & Geophysical Services, Ltd., 123 Vic-
toria St., London S.W. 1, England
Minneapolis-Honeywell, Heiland Div., 130 E.
6th Ave., Denver 3, Colo.
Minneapolis-Honeywell Regulator Co., Indus-
trial Div., Wayne & Windrim Avenues,
Philadelphia 44, Pa.
Minneapolis-Honeywell Regulator Co., Micro
Switch Div., Freepoint, Ill.
Minneapolis-Moline Co., P.O. Box 1050, Minne-
apolis 1, Minn.
Minnesota Mng. & Mfg. Co., Irvington Var-
nish & Insulator Div., 6 Arroyo Terrace,
Irvington 11, N.J.
MIRRELES, BICKERTON & DAY LTD.,
MIRRELES WORKS, HAZEL GROVE,
STOCKPORT CHESHIRE, ENGLAND
Mitchell, Miles J., 10 Santa Margarita Dr.,
San Rafael, Calif.
Mitchell Ropeways Ltd., Mitro House Burghley
Rd., Peterborough, Northants, England
Mixermobil Mfg. Inc., 5027 N.E. Killings-
worth, Portland 20, Ore.
Mixing Equipment Co., P.O. Box 1370, Ro-
chester 3, N.Y.
Moab Drilling Co., 62 E. Center St., Box 487,
Moab, Utah
Mobile Drilling, Inc., 600 North Pennsylvania
St., Indianapolis 4, Ind.
Monarch Equipment Co., 7850 Laurel Grove
Ave., N. Hollywood, Calif.
Monsanto Chemical Co., 1700 S. Second St.,
St. Louis 4, Mo.
Morgardshammars Mek. Verkstads AB, Morg-
ardshammer, Sweden
Morris Machine Works, Baldwinville, N.Y.
Morris Bros. Machinery Co., 2900 Brighton
Bldg., Denver, Colo.
Morse Chain Co., Ithaca, N.Y.
George Moss Pty. Ltd., 10 Woolwich St.,
Leederville (Western Australia) Australia
MOTOR RAIL, LTD., SIMPLEX WORKS,
BEDFORD, ENGLAND
Motorola Communication & Electronics, Inc.,
4501 W. Augusta Blvd., Chicago 51, Ill.

N

NAGLE PUMPS, INC., 1250 CENTER AVE.,
CHICAGO HEIGHTS, HARVEY, ILL.
Napco Industries Inc., 834 N. Seventh St., Min-
neapolis 11, Minn.
National Carbon Co., 60 E. 42nd St., N.Y. 17,
N.Y.
National First Aid Supply Co., 25 W. 15th St.,
N.Y. 11, N.Y.
NATIONAL FILTER MEDIA CORP., 1717
DIXWELL AVE., NEW HAVEN 14,
CONN.
National Fuse & Powder Co., 3801 Delgany St.,
Denver 5, Colorado
NATIONAL IRON CO., 59TH AVE. & RAM-
SEY ST., DULUTH 7, MINN.
NATIONAL MALLEABLE & STEEL CAST-
INGS CO., 10600 QUINCY AVE., CLEVEL-
AND 6, OHIO
National Malleable & Steel Castings Co., Cap-
itol Foundry Div., Phoenix, Ariz.
NATIONAL MINE SERVICE CO., 564 AL-
COA BLDG., PITTSBURGH 19, PENN-
SYLVANIA
National Supply Co., 2 Gateway Center, Pitts-
burgh 22, Pa.
NATIONAL TANK & PIPE CO., 2301 N. CO-
LUMBIA BLVD., PORTLAND 17, ORE.
NAYLOR PIPE CO., 1242 E. 52ND ST., CHI-
CAGO 19, ILL.
Nelson, Ltd., W & H Nelbest Works, Mossend,
Lanarkshire, Scotland
New York Air Brake Co., The, Aurora Pump
Div., 619 Loucks St., Aurora, Ill.
Newport Industries Co., Div. of Heyden-New-
port Chemical Corp., 343 Madison Ave.,
New York 17, N.Y.
Newton, Chambers & Co., Ltd., Thorn Cliffe
Nr. Sheffield, England
Nies Ball Bearing Co., 20th & Hunting Park
Ave., Philadelphia 40, Pa.
Nichols Engineering & Research Corp., 70
Pine St., New York 5, N.Y.
Nolan Co., Bowerston, Ohio
NORDBERG MFG. CO., 3073 S. CHASE AVE.,
MILWAUKEE 1, WIS.
North American Refractories Co., 1012 Nat'l
City-E 6th St. Bldg., Cleveland 14, Ohio
North British Locomotive Co. Ltd., 110 Flem-
ington St., Springfield, Glasgow, N. I.,
Scotland
NORTHERN BLOWER CO., 4429 BARBER-
TON AVE., CLEVELAND 2, OHIO
Northwest Engr. Co., 135 S. LaSalle St., Chi-
cago 3, Ill.
Norwood Co., 1 New Bond St., Worcester 6,
Mass.
Norwood Controls Unit, Detroit Controls Div.
of American Standard, 934 Washington
St., Norwood, Mass.

Nucleonic Corp. of America, 196 Degraw St.,
Brooklyn 31, N.Y.

O

Ohio Brass Co., 380 North Main St., Man-
field, Ohio
Ohio Carbon Co., 12508 Berea Rd., Cleveland
11, Ohio
Ohio Gear Co., 1333 E. 179th St., Cleveland 10,
Ohio
Ohio Locomotive Crane Co., Bucyrus, Ohio
OIL TOOL MFG. CO., BOX 712 TONKAWA,
OKLA.
Okonite Co., Hazard Insulated Wire Works
Div., 220 Passaic St., Passaic, N.J.
Oldham & Son, Ltd., Denton, Lancaster, Eng-
land
Olin Mathieson Chem. Corp., Explosives Div.,
East Alton,
Oliver Corp., 400 W. Madison St., Chicago 6,
Ill.
Oliver Corp., A. B. Farquhar Div., 142 N.
Duke St., York, Pa.
Onan Sons, Inc., D. W., 2515 University Ave.,
S.E., Minneapolis 14, Minn.
Ore & Chemical Co., 80 Broad St., New York,
N.Y.
ORTRUC, INC., 320 SOUTH GRAND ST.,
ST. LOUIS, MO.
ORENSTEIN-KOPPEL UND LUBECKER
MASCHINENBAU AG, POSTFACH 270,
LUBECK, GERMANY
Osborne Lab. Inc., Raymond G., 235 W. 27th,
Los Angeles 7, Calif.
Osmose Wood Preserving Co. of America Inc.,
980 Elliott St., Buffalo 9, N.Y.
Overstrom & Sons, 2213 W. Mission Rd., Al-
hambra, Calif.
Owen Bucket Co., The, 6901 Breakwater Ave.,
Cincinnati 2, Ohio
Oxy-Catalyst, Inc., P. O. Box 151, Wayne, Pa.

P

Pacific Car & Foundry Co., 4th & Factory,
London, Wash.
PACIFIC FOUNDRY CO. LTD., 3100 19TH
ST., SAN FRANCISCO 10, CALIF.
Pacific Lumber Co., The, 100 Bush St., San
Francisco 4, Calif.
PACIFIC PIPE CO., 491 FOLSOM ST., SAN
FRANCISCO, CALIF.
Pacific Wire Rope Co., 1840 E. 15th St., Los
Angeles 21, Calif.
Pack Mfg. Co., 55 West 1st North, Logan,
Utah
Page Engineering Co., Clearing Post Office,
Chicago 38, Ill.
Parker Ltd., Frederick, Viaduct Works,
Leicester Leicestershire, England
Parker Safety Equip. Co., 785 Lyons Ave.,
Irvington 11, N.J.
Peale, Rogers, 315 Montgomery St., San Fran-
cisco, Calif.
Peerless Pump Div., Food Machinery & Chem-
ical Corp., 801 W. Ave. 26, Los Angeles
31, Calif.
Pegson Ltd., Coalville, Leicestershire, England
Penna Assoc., Central No. 29 Angostura, Sina-
loa, Mexico
Pendleton Woolen Mills, Washougal Branch,
P.O. Box 655, Washougal, Wash.
PENNSALT CHEMICALS CORP., 3 PENN
NATIONTER, PHILA. 2, PA.
Pennsylvania Crusher Div., Bath Iron Works
Corp., 323 S. Matlack St., West Chester,
Pa.
Pennsylvania Drilling Co., 1205 Chartiers Ave.,
Pittsburgh 20, Pa.
Permal, Inc., P.O. Box 718, Mount Pleasant,
Pa.
Permutit Co., The, A Div. of Pfaunder Per-
mutit, Inc., 60 W. 44th St., New York,
N.Y.
Peterson Filters & Engr. Co., 1949 So 2nd
West, P.O. Box 606, Salt Lake City, Utah
Petibone Mulliken Corp., 4710 W. Division St.,
Chicago 51, Ill.
Phelps Dodge Refining Corp., 40 Wall St.,
New York 5, N.Y.
Phelps Dodge Copper Prod. Corp., 300 Park
Ave., New York, N.Y.
Philadelphia Gear Works, Inc., G-St. below
Erie Ave. & G St., Philadelphia 34, Pa.
Philadelphia Quartz Co., 11461 Public Ledger
Bldg., Philadelphia 6, Pa.
Piggott Projects, 1057 Howard St., San Fran-
cisco, Calif.
Philips Electronics, Inc., Instruments Div., 750
South Fulton Ave., Mt. Vernon, N.Y.
Pierce, Roger V., 805 Newhouse Bldg., Salt
Lake City 4, Utah
Pioneer Engineering Div., Ppor & Co., Inc.,
3200 Como Ave., S.E., Minneapolis, Minn.
Pittman Manufacturing Co., 800 W. 79th Ter-
race, Kansas City, Mo.
Plymouth Locomotive Works, Div. of the Fate-
Root-Heath Co., Plymouth, Ohio
Pleuger Unterwasserpumpen GmbH, Hamburg-
Wandbek, Friedric-Ebert-Damm 101, Ger-
many
Pohlig, J. (AG), Pohligstr. 1, Kohn-Zellstock,
West Germany

Polysius G.m.b.H., Graf-Galenstr. 17, Neu-
beckum, Westf. Germany
Porter Co., Inc. H. K. Lescan Wire Rope Div.,
2727 Hamilton Ave., St. Louis, Mo.
**PORTER CO., INC. H. K. QUAKER RUB-
BER DIV., TACONY & COMLY STREETS,
PHILADELPHIA, PA.**
Post Co., Frederick, 185 E. Ohio, Chicago, Ill.
Powermite Drill & Tool Co., P.O. Box 1121,
Ontario, Calif.
Precision Radiation Instruments Inc., 4233 W.
Jefferson Blvd., Los Angeles 16, Calif.
Price, Franklin L. G., 1106 Northern Life
Tower, Seattle 1, Wash.
Princeton Gripholst, Inc., 83 George St., Bos-
ton 19, Mass.
Productive Equipment Corp., 3996 W. Lake St.,
Chicago 12, Ill.
**PROGRESSIVE COLOR & CHEMICAL CO.,
INC., 395 FIFTH AVE., NEW YORK,
N.Y.**
Palmsan Safety Equip. Corp., 644 Pacific St.,
Brooklyn 17, N.Y.
Pulva Corp., 850 High St., Perth Amboy, N.J.
Punch-Lok Co., 821 N. Justice St., Chicago 7,
Ill.
Pyrene C-O-Two Div., Fyr-Fryer Co., The,
P.O. Box 750, Newark 1, N.J.
Pyrometer Instrument Co., Inc., 92 Portland
Ave., Bergenfield, N.J.

Q

Quaker Pioneer Rubber Mills, 520 Fourth St.,
San Francisco, Calif.
**QUAKER RUBBER DIV., H. K. PORTER CO.,
TACONY & COMLY STS., PHILA 24, PA.**
Quicks-Way Truck Shorel Co., 2401 E. 40th
Ave., Box 1800, Denver, Colo.

R

Radice Co., Inc., 489 5th Ave., New York 17,
N.Y.
Rankin Mfg. Co., 616 S. Marengo Ave., Al-
hambra, Calif.
Rancombes & Rapier, Ltd., Waterside Works,
Ipswich, England
Rapid Magnetic Machines, Ltd., Lombard St.,
Birmingham 12, England
Rawson Electrical Instrument Co., 110 Potter
St., Cambridge 42, Mass.
Raybestos-Manhattan, Inc., 61 Willett St.,
Passaic, N.J.
Ray-O-Vac Co., Div. of Electric Storage Bat-
tery Co., 212 E. Washington Ave., Madison
19, Wis.
Ray-O-Vac Co., Willson Products Div., 2nd &
Washington St., Reading, Pa.
Ready-Power Co., 11231 Friend Ave., Detroit
14, Mich.
**REED ENGINEERING CO., 629 SO. INGLE-
WOOD AVE., INGLEWOOD, CALIF.**
Reeves Pulley Co., 1226-7th St., Columbus,
Ind.
Reich Bros. Mfg. Co., 1439 Aah St., Terre
Haute, Ind.
Reichdrill Mfg. Co. Ltd., Coltness, Newmains,
Wishaw, Lanarkshire, Scotland
Relly Tar & Chemical Corp., 1618 Merchants
Bank Building, Indianapolis 4, Ind.
Reliance Electric & Engineering Co., 24701
Euclid Ave., Cleveland 17, Ohio
Remington Arms Co., Inc., 939 Barnum Ave.,
Bridgeport 2, Conn.
Reynolds Chairs Ltd., Reynolds House, Wythen-
shaw, Manchester, England
Republic Rubber Div., Los Rubber & Tire
Corp., Albert St., Youngstown 1, Ohio
Republic Steel Corp., Republic Bldg., Cleve-
land 1, Ohio
Republic Steel Corp., Bolt & Chain Div., 1970
Carter Rd., Cleveland, Ohio
Republic Steel Corp., Truscon Steel Div.,
Albert St., Youngstown 1, Ohio
Research Cottrell, Inc., P.O. Box 780, Bound
Brook, N.J.
Resisto-Loy Co., Inc., 1251 Phillips Ave., S.W.,
Grand Rapids 7, Mich.
Revera Copper & Brass Inc., 230 Park Ave.,
New York 17, N.Y.
**RIBLET TRAMWAY CO., N. 1231 WASH-
INGTON ST., SPOKANE, WASH.**
Rice Pump & Mach. Co., Belgium, Wisc.
Richardson Scale Co., 688 Van Houten Ave.,
Clifton, N.J.
Rick Helicopter, San Francisco International
Airport, San Francisco, Calif.
Rip-Bite, Ltd., Calverly Lane, Dronfield,
Sheffield, England
Robbins & Myers, Inc., 1345 Lagonda Ave.,
Springfield, Ohio
Roberts & Schaefer Co., 130 N. Wells St.,
Chicago 6, Ill.
Robinson Clay Product Co., The, P.O. Box
1070, 65 W. State St., Akron 9, Ohio
Rockwell Mfg. Co., 400 N. Lexington Ave.,
Pittsburgh 8, Pa.
Rodale Mfg. Co. Inc., 6th & Minor Sts., Em-
maus, Pa.
Roder-Blackburn Intl. Corp., 149 Broadway,
N.Y. 6, N.Y.
**ROEBLING SONS CORP., JOHN A., 640 S.
BROAD ST., TRENTON 2, N.J.**
Rogers Iron Works Co., Joplin, Mo.

Rahn & Haas Co., Washington Square, Phila-
delphia 6, Pa.
Rome Cable Corp., Ridge 66, P.O. Box 71,
Rome, N.Y.
Rose Mfg. Co., 2700 West Barbary Place,
Denver, Colo.
Rose Screen & Feeder Co., 100 Quimby St.,
Westfield, N.J.
Rothe Erde Eisenwerk G.m.b.H., Dortmund,
Germany
Round Chain Co., Broadway & Chainercraft
Rd., Cleveland 6, Ohio
Rubber Improvement Ltd., Rilex Works, Wel-
lingborough, Northants, England
Ruhrkuststoff G.m.b.H., Mulheim-Ruhr, West
Germany
Ruston & Hornsby, Ltd. Lincoln, England
**RUSTON-BUCYRUS, LTD., LINCOLN, ENG-
LAND**
Ruth Co., The, 1437 Blake St., Denver 2, Colo.
Ryerson, Joseph T. & Son, Inc., 3585 W. 16th
St., Chicago 8, Ill.

S

Safety Clothing & Equip. Co., 1900 E. 69
St., Cleveland, Ohio
Safety First Supply Co., 425 Magee St.,
Pittsburgh 19, Pa.
Safety Products Ltd., Holmesthorpe Ave., Red-
hill, Surrey, England
Salem Tool Co., 707 S. Ellsworth Ave., Salem,
Ohio
Salzgitter Maschinen AG Salzgitter-Bad, Ger-
many, Fed. Rep. of Germany
Sanford-Day Iron Wks., Inc., Dale Ave., Box
1811, Knoxville, Tenn.
**SAUERMAN BROS., INC., 638 S. 28TH AVE.,
BELLWOOD, ILL.**
Schaefer & Associates, F. C., P.O. Box 54,
Parral, Chihuahua, Mexico
Schaeffer Poidomest Co., 2823 Smallman St.,
Pittsburgh 32, Pa.
Scharf, Heinrich G.m.b.H., Hamm (Westfalia)
Germany
**SCHIEDENHELM, F. W., 38 CHURCH ST.,
NEW YORK 7, N.Y.**
Schield Bantam Co., Park St., Waverly, Iowa
Schramm Inc., West Chester, Pa.
Schroter & Lockwood, 3515 Sunset Blvd., Los
Angeles 36, Calif.
Scientific Instrument Company
Scott's Concentrators, P.O. Box 211, Fair
Oaks, Calif.
Screen Equip. Co., Inc., Buffalo 25, N.Y.
Security Engineering Div., Dresser operations,
Inc., P.O. Box 16347, Dallas, Texas
Sapor Microsplitter Supply, 1545 S. Oak Park
Ave., Bensenville, Illinois
Service Supply Corp., 30th & Erie Ave.,
Philadelphia 32, Pa.
Shaft & Devel. Mach. Co., 808 Newhouse Bldg.,
Shamrock Drilling Enterprises, Inc., 311 E.
Hogar Bldg., Manila, P.I.
Sharples Chemicals Inc., 1100 Widener Bldg.,
Philadelphia 7, Pa.
**SHEFFIELD STEEL DIV., ARMCO STEEL
CORP., SHEFFIELD STATION, KAN-
SAS CITY 25, MO.**
Shell Oil Co., 100 Bush St., San Francisco 6,
Calif.
Shepard Nile Crane & Hoist Corp., Schuyler
Ave., Montclair Falls, N.Y.
Sheppard Co. R. H., 101 Philadelphia St.,
Hanover, Pa.
Siebtechnik G.m.b.H., Bleichstr-23, Mulheim
(Ruhr) Germany
Siemens & Halske AG, 50 Werner-Von-Siemen-
str. Erlangen, W. Germany
Silver Engineering Works, Inc., 3915 Blake
St., Denver, Colo.
**SIMPLEX WIRE & CABLE CO., 79 SIDNEY
ST., CAMBRIDGE 39, MASS.**
Simplicity Engineering Co., 200 South Oak St.,
Durand, Mich.
SKF Hellfors Jernverk, Hallefors, Sweden
SKF Industries, Inc., Front St. & Erie
Ave., P.O. Box 6781, Philadelphia 32, Pa.
**SKOOKUM CO., INC., 8594 N. CRAWFORD
ST., PORTLAND 3, ORE.**
Sloan & Associates, Inc., Photogrammetric
Engineers, 51 E. Pothill Blvd., Arcadia,
Calif.
**SMITH & CO., F. L., 11 WEST 41 ST., NEW
YORK 36, N.Y.**
Smit & Co., Inc., Antea, 111 Eighth Ave.,
New York 11, N.Y.
Smit & Sons, Inc., J. K., Murray Hill, New
Jersey
Smith-Blair, Inc., 535 Railroad Ave., So. San
Francisco, Calif.
Smith-Emery Co., 781 East Washington Blvd.,
Los Angeles 21, Calif.
Smith & Sons (Rodley) Ltd., Thos., Rodley,
Leeds, England
Smith Engineering Works, 532 E. Capital
Drive, Milwaukee 12, Wis.
Socony-Vacuum Oil Co., 26 Broadway, New
York 4, N.Y.
Solar Aircraft Co., 2200 Pacific Hwy., San
Diego 12, Calif.
Sonneborn Sons, Inc., L., 404 Fourth Ave.,
New York 10, N.Y.
**SOUTHERN SPECTROGRAPHIC LABORA-
TORY, BOX 6914, DEPT. B, DALLAS 21,
TEXAS**

**SOUTHWESTERN ENGINEERING CO., 4890
SANTA FE AVE., LOS ANGELES 59,
CALIF.**
**SPANG & CO., ETNA ST., P.O. BOX 751,
BUTLER, PA.**
Spencer Chemical Co., 616 Dwight Bldg., Kan-
sas City, Mo.
Spencer Turbine Co., 486 New Park Ave.,
Hartford 6, Conn.
**SPRAGUE & HENWOOD, INC., BOX 446,
SCRANTON 2, PA.**
Spraying Systems Co., 3301 West Randolph St.,
Bellwood, Illinois
Stahlwerke Brunninghaus G.m.b.H., Hagenerstr.
4, Westhofen (Westf.) Germany
Stahlwerke Sudwestfalen AG, Brunninghaus,
Westhofen W. Germany
**STANCO MFGS. & SALES, INC., 1666
NINTH STREET (COR. OLYMPIC
BLVD.) SANTA MONICA, CALIF.**
Standard Electric Mfg. Co., Inc., Haddon Ave.,
West Berlin, N.J.
Standard Filterbau Ges. m.b.H., Lodenheide
3, Munster Westf. W. Germany
Standard Oil Co. of Calif. Western Operations,
Inc., 225 Bush St., San Francisco, Calif.
**STANDARD STEEL CORP., P.O. BOX 55252
LOS ANGELES 54, CALIF.**
Stanton & Son Inc., E. J., P.O. Box 3816 Ter-
minal Annex, Los Angeles 54, Calif.
Staplex Co., The Air Sampler Div., 777 Fifth
Ave., Brooklyn 32, N.Y.
Star Expansion Pacific, Inc., 142 Liberty St.,
N.Y. 6, N.Y.
Star-Kimble Motor Div.—see Michle-Goss-Dex-
ter, Inc.
Star Wire Screen & Iron Works, Inc.,
2515 San Fernando Road, Los Angeles
65, Calif.
Stauffer Chemical Co., Consolidated Chemical
Industries Div., 636 California St., San
Francisco 8, Calif., and 6910 Fannin St.,
Houston 25, Texas
Stearns Magnetic Products, 685 S. 28th St.,
Milwaukee 46, Wis.
**STEARNS ROGER MFG. CO., 608 BANNOCK
ST., DENVER, COLO.**
John G. Stein & Co., Ltd., Bonny Bridge, Scot-
land
Stenberg Corp., AB, Duvedsvagen 17, Stock-
holm-Zällingby, Sweden
Stenberg Corp. of Canada Ltd., 8230 Mayrand
St., Montreal 8, Quebec, Canada
**STENBERG MFG. CORP., HOOSICK FALLS,
N.Y.**
**STEPHENS-ADAMSON MFG. CO., 13
RIDGEWAY AVE., AURORA, ILL.**
Sterling Electric Motors, Inc., 5401 Telegraph
Rd., Los Angeles 22, Calif.
Stewart-Warner Corp., 1826 Diversay Parkway,
Chicago 14, Ill.
**STILL & STILL CONSULTING MNG. ENG.
& GEO. P. O. BOX 1512, PRESCOTT,
ARIZ.**
Stonhard Co., Inc., 1304 Spring Garden St.,
Phila., Pa.
**STOODY CO., 11932 EAST SLAUSON AVE.,
WHITTIER, CALIF.**
Stowell & Co., W. H., 421 Sprague Ave.,
Spokane 4, Wash.
Stubbs, Albert, Vlotho-Wasser, Western Ger-
many
Stuls-Sieckes Co., 929-939 Port Ave., Elizabeth,
N.J.
**STURTEVANT MILL CO., 157 CLAYTON
ST., DORCHESTER, BOSTON 22, MASS.**
Superior-Lidgerwood-Mundy Corp., 1101 John
Ave., Superior, Wisconsin
Superior-Lidgerwood-Mundy Corp., 100 Howard
St., San Francisco, Calif.
Richard Sutcliffe, Ltd., Universal Works, Hor-
bury, Wakefield, Yorkshire, England
Svenska Diamantbergsborrnings AB, Stockholm,
Sweden
Svenska Motorborr AB, Stockholm-Solna,
Sweden
Swift & Co., Technical Prod. Plant, 1800 16th
St., Hammond, Ind.
Symons Bros. Co., 11551 Hart St., P.O. Box
770, No. Hollywood, Calif.
Syntron Co., 166 Lexington Ave., Homer City,
Pa.

T

Talcott, Inc., W.O. & M.W., Box 1307, Provi-
dence, R.I.
Tamping Bag Co., Div. Pickard Industries,
Inc., 218 S. Third St., Mt. Vernon, Ill.
Taylor-Wharton Steel & Steel Co., High
Bridge, N.J.
Techn. Ind. en Handelsonderaeming, 81-89
Wateringsechans Amsterdam C, Nether-
lands
**TELLURIDE IRON WORKS CO., 400 MAIN
AVE., DURANGO, COLO.**
**TENNANT, C. SONS & CO., of N.Y., THE
SINK & PLAT DIV., 100 PARK AVE.,
NEW YORK 17, N.Y.**
Tennessee Coal & Iron Div., U. S. Steel Corp.,
P. O. Box 599, Fairfield, Ala.
Texas Co., 135 E. 42nd St., New York 17,
N.Y.
Texas Gulf Sulphur Co., Newgulf, Texas.
Texas Instruments, Inc. Industrial Instrumen-

tation Div., 3600 Buffalo Speedway, Houston 6, Texas
THERMOLD CO., 200 WHITEHEAD RD., TRENTON 6, N.J.
 These Shovel Co., 25th & Fulton St., Lorain, Ohio
 Thiele, August G.m.b.H., Fabrik für Ketten und Kettenförderer, (21b.) Kalthof/uh. Schwerte/Ruhr Western Germany
THOMAS, CONRAD W., BANK OF THE SOUTHWEST BLDG., HOUSTON, TEX.
 Thomas Flexible Coupling Co., Main Ave. & Biddle St., Warren, Pa.
 Thomas Laughlin Div., Am. Hoist & Derrick Co., 146 Fore St., Portland 6, Maine
 Thompson Balance Co., 502 E. 18th Ave., Denver 18, Colo.
 Thompson-Berg Company, Iron Mt., Mich.
 Thor Power Tool Co., 175 N. State St., Chicago, Ill.
 Three Point Bolt Lacing, Inc., P.O. Box 389, Peace Dale, R.I.
 Throwaway Bit Corp., 4200 N.W. Yeon Ave., Portland 10, Oregon
 Thunus Meknisko Vackated AS, 180 Drammensveien, Oslo, Norway
 Tide Water Assoc. Oil Co., 17 Battery Place, New York 4, N.Y.
 Timber Engr. Co., 1313-18th St., N.W., Washington 6, D.C.
TIMKEN ROLLER BEARING CO. THE, 1325 DUEBKE AVE. S.W., CANTON, OHIO
 Toledo Scale Div., Toledo Scale Corp., 1042 Telegraph Rd., Toledo 13, Ohio
TOMCO Products Co., 5426 Schuhmacher Lane, Houston 27, Texas
 Tool Steel Gear & Pinion Co., 211 Township Ave., Cincinnati 16, Ohio
 Torit Mfg. Co., 292 Walnut St., St. Paul 2, Minn.
 Turkret G.m.b.H., Zweigerstr. 36/38 Industrie-Hans, Essen, Germany
 Tracerlab Inc., 1601 Trapelo Road, Waltham 54, Mass.
 Tractomotive Corp., County Line Rd., Deerfield, Ill.
TRAYLOR ENGINEERING & MFG. CO., 10TH & MILL STS., ALLENTOWN, PA.
THREADWELL CO. INC., M. H., 140 CEDAR ST., NEW YORK 6, N.Y.
 Trico Fuse Mfg. Co., 2345 N. 5th St., Milwaukee 12, Wis.
 Trojan Powder Co., 17 N. 7th St., Allentown, Pa.
 Trojan Powder Co., 629 Market St., San Francisco 4, Calif.
 Trombetta Solenoid Corp., 329 N. Milwaukee St., Milwaukee 2, Wis.
 Truscon Steel Div., Republic Steel Corp., Albert St., Youngstown 1, Ohio
 Trus Gun-All Equipment Corp., P.O. Box 2326, Tulsa, Oklahoma
 Turbo-Maschinen A.G. Nusse & Grafer, Sprockhovel, Westf. W. Germany
TURNER & ASSOCIATES, 350 EAST CAMELBACK RD., PHOENIX, ARIZ.
 Turner Bros. Asbestos Ltd., Rochdale, Lancs, England
 Tweco Prod., Inc., P.O. Box 666, 1450 S. Mosely, Wichita 1, Kansas
 Tweedberg, Kleppe S.A., Av. Rio Branco, 25 P.O. Box 3144, Rio de Janeiro, Brasil
 Twin Disc Clutch Co., 1328 Racine St., Racine, Wis.
 Twining Laboratories, 2827 Fresno St., P.O. Box 1472, Fresno, Calif.
TYLER CO. THE W. S., 3615 SUPERIOR AVE., CLEVELAND 14, OHIO
 Tyson Bearing Co., Div. of S-K-F Industries, Inc., Oberlin Rd., Massillon, Ohio

U

Uddeholm Co. of America, Inc., 155 East 44th St., New York 17, N.Y.
 Uddeholms Aktiebolag, Uddeholm, Sweden
 Uhden, Inc., 508 Grant St., Dennison, Ohio
 Ultra-Violet Producers, Inc., Pasadena Ave., S. Pasadena, Calif.
ULTRA-VIOLET PRODUCTS, INC., 5114 WALNUT GROVE AVE., SAN GABRIEL, CALIF.
 Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N.Y.
 Union Carbide & Carbon Corp., Haynes Stellite Div., 725 S. Lindsay St., Kokomo, Ind.
 Union Carbide & Carbon Corp., Linde Air Prod. Div., 30 E. 42nd St., New York 17, N.Y.
 Union Iron Works, E. 217, Montgomery, Spokane, Wash.
 Union Oil Co. of Calif., 617 W. 7th St., Los Angeles 17, Calif.
 Union Wire Rope Corp., Subs. of Armco Steel, 21st & Manchester Ave., Kansas City 26, Unit Crane & Shovel Corp., 6411 W. Burnham St., Milwaukee 19, Wis.
 United Geophysical Corp., Box M, Pasadena, Calif.
 U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Box 2058, Terminal Annex, Los Angeles 54, Calif.
 U. S. Hoffman Mach. Corp., 103-4th Ave., N.Y.
 U. S. Instrument Corp., P.O. Box 1191, Charlottesville, Va.
 U. S. Rubber Co., 1230 Ave. Americas, New York 20, N.Y.

United States Rubber Intl., 1230 Ave. Americas, N.Y. 20, N.Y.
 U. S. Smelting Furnace Co., E "A" St. & L & N Tracts, Ballyville, Ill.
 U. S. STEEL CORP., 25 WILLIAM PENN PLACE, PITTSBURGH 39, PA.
 U. S. Steel Corp., American Bridge Div., 525 Wm. Penn Place, Pittsburgh 30, Pa.
 U. S. Steel Corp., American Steel & Wire Div., Rockefeller Bldg., Cleveland 13, Ohio
 U. S. STEEL CORP., COLUMBIA-GENEVA STEEL DIV., 123 MONTGOMERY ST., SAN FRANCISCO 6, CAL.
 U. S. STEEL EXPORT CO., 36 CHURCH ST., NEW YORK 8, N.Y.
 United States Steel Corp., Tennessee Coal & Iron Div., P.O. Box 569, Fairfield, Ala.
 Universal Dredge Mfg. Co., 124 Wasee Market, Denver 4, Colo.
 Universal Engineering Corp., 625 C. Ave., N.W. Cedar Rapids, Iowa
 Universal Road Mach. Co., 117 Liberty St., N.Y. 6, N.Y.
 Universal Vibrating Screen Co., Deane Blvd. & St. Paul RR, Racine, Wis.
 Utah Fire Clay Co., P.O. Box 127, Salt Lake City, Utah

V

EARL C. VAN HORN, CONSULTING GEOLOGIST, P. O. BOX 7, MURPHY, N.C.
 L. M. Van Moppes & Sons (Diamond Tools, Ltd.) Basingstoke, Hampshire, England
VAREL DIAMOND PRODUCTS CO., 2239 DENTON DR., DALLAS 20, TEXAS
VAREL MFG. CO., 2239 DENTON DR., P.O. BOX 13146 DALLAS, TEXAS
 Varian Associates, 611 Hansen Way, Palo Alto 29, Calif.
 Vascology-Ramet Corp., 800 Market St., Waukegan, Ill.
 Vaughan Grain Co., Ltd., West Gorton, Manchester 12, England
VICKERS-ARMSTRONG (TRACTORS) LTD., VICKERS HOUSE, BROADWAY, WESTMINSTER, LONDON, S.W.1, ENGLAND
 Victaulic Co., P. O. Box 609, Elizabeth, New Jersey
 The Visco Engineering Co., Ltd., 161 Stafford Road, Croydon, Surrey, England
 Vulcan Iron Works Co., 739 S. Main St., Wilkes-Barre, Pa.
VULCAN IRON WORKS CO. THE, 2960 SO. FOX ST., ENGLEWOOD, COLORADO

W

Wadsworth Electric Mfg. Co., Covington, Ky.
 Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Mo.
 Wagner Tractor, Inc., P.O. Box 7444, Portland, Oregon
 WAH Chang Mining Corp., Woolworth Bldg., 233 Broadway New York 7, N.Y.
 Walker Bros. (Wigan) Ltd., Pagesfield Ironworks, Wigan, Lancs, England
 Walker Machinery Co., 1645 Hansford St., P.O. Box 2427, Charleston 20, W. Va.
 Wall Rope Wks., Inc., 48 South St., N.Y. 5, N.Y.
 Walvoord, Inc., O. W., 300 Detroit St., Denver 6, Colo.
 Walworth Co., 750-3rd Ave., N.Y. 17, N.Y.
 Ward Leonard Electric Co., 115 MacQuesten Parkway South, Mount Vernon, N.Y.
WARN MFG. CO. INC., BOX 664, 1831 PACIFIC HIGHWAY, SEATTLE, WASH.
 Warren, Morrison Ltd., 41, St. James's Place, London, S.W. 1
 Washington Iron Works, 1520 6th Ave. S., Seattle 4, Wash.
 Washington Machinery Co., 7329 East Marginal Way, Seattle 8, Wash.
 Waukesha Motor Co., West St. Paul Ave., Waukesha, Wis.
 WEDAG, Westfalia Dinnendahl Gropel A.G., Postfach 397, 402 Bochum, West Germany
 Wedge Wire Corp., Wellington, Ohio
 Wellman Co. S.K., 200 Egbert Rd., Bedford, Ohio
 Wellman Engineering Co., 7000 Central Ave., Cleveland 4, Ohio
 Werf Conrad & Stork Hilsch N.V., P.O. Box 134, Haarlem, Holland
WESSERHUTTE OTTO WOLFF G.M.B.H., BAD OETENHAUSEN, W. GERMANY
 West Chester Chem. Co., Box 39, West Chester, Pa.
 Western Exploration Co., 2155 Redwood Highway, Novato, Calif.
 Western Gear Corp., P.O. Box 132, Lynwood, Calif.
 Western Gear Corp., P.O. Box 126, Belmont, Calif.
 Western Insulated Wire Co., 2425 E. 80th St., Los Angeles 53, Calif.
 Western-Knapp Engr. Co., 650-5th St., San Francisco Calif.
WESTERN MACHINERY CO., 650-5TH ST., SAN FRANCISCO 7, CALIF.
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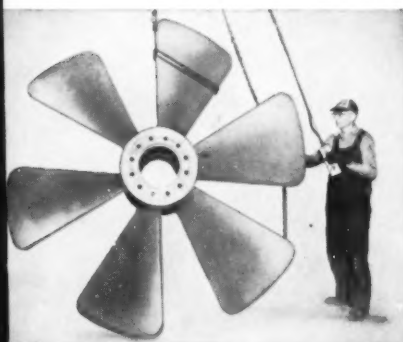
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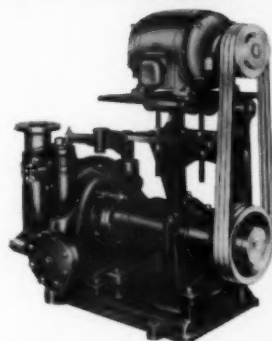
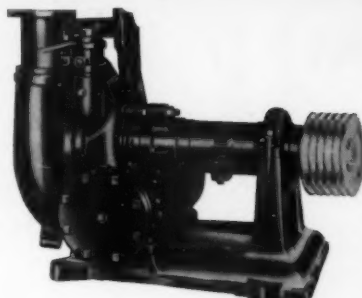


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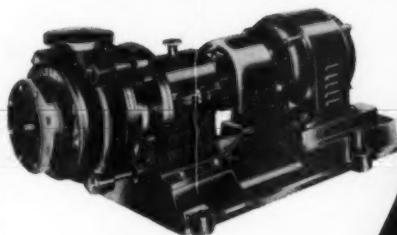
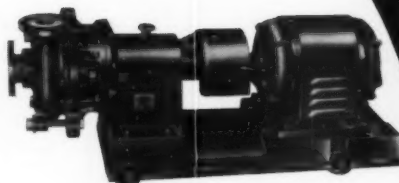
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